

SYSTEMATICS OF NEOTROPICAL HIRSTIONYSSUS MITES WITH SPECIAL EMPHASIS ON VENEZUELA (ACARINA: MESOSTIGMATA)

by

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ABSTRACT

This paper presents the results of a systematic study of mites of the genus *Hirstionyssus* Fonseca collected from mammals, primarily in Venezuela, but including one collection each from Colombia, Nicaragua, and British Honduras. Previously described species from Panamá and Brazil are reviewed and new distributional records are listed. The known Neotropical fauna of *Hirstionyssus* mites includes 15 species, 7 of which are described here as new: *H. proctolatus* n. sp.; *H. brachysternum* n. sp.; *H. dorsolatus* n. sp.; *H. rhipidomys* n. sp.; *H. venezuelensis* n. sp.; *H. brevicarcalar* n. sp.;

and *H. parvisoma* n. sp. The previously unknown male and deutonymph of *H. keenani* Strandtmann and Yunker are described, and new collection records are given for *H. heteromydis* Strandtmann and Yunker, *H. keenani* Strandtmann and Yunker, *H. butantanensis* Fonseca, and *H. galindoi* Strandtmann and Yunker. A key for identification of females and males of Neotropical *Hirstionyssus* is given and 9 species are illustrated. Collection data are provided for each species and, where pertinent, discussions of morphological characters and variability are provided.

INTRODUCTION

This study of *Hirstionyssus* is based primarily on mites collected from mammals in Venezuela between July 1965 and August 1968 by the Smithsonian Venezuela Project. Field groups headed by Messrs. N. E. Peterson, M. D. Tuttle, and A. L. Tuttle collected the hosts and ectoparasites. Dr. Charles O. Handley, Jr., Smithsonian Institution, identified the hosts. Also included in the study are single collections from Colombia (N. E. Peterson, collector), Nicaragua (Rocky Mountain Laboratory, J. K. Jones, collector), and British Honduras (British Museum, Natural History, D. J. Lewis, collector). Prior to this study the only published reports of *Hirstionyssus* mites from Central and South America were those of Fonseca (1932), who described *H. butantanensis* from white laboratory mice in Brazil, and Strandtmann and Yunker (1966), who described seven new species from Panamá mammals. Objectives of this study are to clarify the systematics of Neotropical *Hirstionyssus* mites and to provide data on host-parasite relationships.

The concepts of the family Laelapidae Berlese, 1892, the subfamily Hirstionyssinae Evans and Till, 1966, and the genus *Hirstionyssus* Fonseca, 1948, are essentially those of Radovsky (1966, 1967, 1969), Evans and Till (1966), and Herrin (1970). The morphological terminology and chaetotactic signatures are basically from Evans and Till (1965, 1966).

Measurements of specimens were made as follows: the dorsal shield was measured at the midline, and the greatest width was used; the peritreme was measured in a straight line from the posterior of the stigma to the anterior end of the peritreme; the length of the sternal shield of females and deutonymphs was measured at the midline, and the holoventral shield of males was measured from setae st. 1 to the postanal seta; the width of the sternal shield of females and deutonymphs and the anterior width of the male holoventral shield was measured between setae st. 1 and st. 2; the genital shield length was measured from the genital setae to the posterior end, and the width was measured just

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posterior to the genital seta; the anal shield length of females and deutonymphs was measured from the anterior margin to the postanal seta, and the greatest width was measured at or near the middle of the anal field.

For each of the new species described, the holotype, allotype (where known), and one or more paratypes will be deposited in the U.S. National Museum of Natural History, Washington, D.C. Paratypes will go to the Rocky Mountain Laboratory, the Universidad Central de Venezuela, Caracas, and the collection of the senior author.

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TAXONOMY

Family Laelapidae Berlese, 1892

Subfamily Hirstionyssinae Evans and Till, 1966

Genus *Hirstionyssus* Fonseca, 1948

Type-species: *Hirstionyssus talpae*
Zemskaya, 1955

Fifteen species of *Hirstionyssus* are known to inhabit the Neotropical region. Nine species are recorded here from Venezuela. These include *H. butantanensis* Fonseca, two of the seven species described from Panamá by Strandtmann and Yunker (1966), and six species described as new in this paper. In addition there are descriptions of another new species from Nicaragua and of the previously unknown male and deutonymph of *H. keenani* Strandtmann and Yunker.

Diagnoses, descriptions, illustrations, and collection data are presented for each of the new species and for two previously described species. The species treatments are arranged in the same order as that presented in the key to females, which reflects the phenetic relationships of the various species.

The following keys to Neotropical *Hirstionyssus* include females of all known species and males of 11 of the 15 species. Males of *H. panamensis*, *H. microchelae*, *H. dorsolatus* n. sp., and *H. galindoi* remain unknown and undescribed.

Since deutonymphs of only 7 of the 15 species have been described, and because of the great difficulty in finding reliable discrete characters by which they can be separated, no key to the deutonymphs is presented here.

Key to Neotropical species of *Hirstionyssus*

Females

1. Coxal spur formula 0-3-2-2; trochanters III and IV and femora III and IV with row of cuticular spurlike processes on their distal margins; anal shield wider than long, somewhat bellshaped, and laterally angulate 2
- Coxal spur formula variable but never 0-3-2-2; without spurlike cuticular processes on any free leg segments; anal shield variable but never extremely wide, bell-shaped, and laterally angulate 3
- 2(1). Posterior margin of sternal shield moderately concave medially (invaginated to level of setae st, 2); setae of coxae II and III acutely spiniform; ventral opisthosomal setae and dorsal opisthosomal setae on soft integument short and spiniform; setae of dorsal shield minute *H. lunatus* Strandtmann and Yunker
- Posterior margin of sternal shield only slightly concave; only anterior seta of coxa III acutely spiniform, all other coxal setae piliform; all ventral and dorsal body se-

- tae normal, not short and spiniform, setae of dorsal shield medium in size, never minute. (Fig. 1-2) *H. proctolatus* n. sp. (p. 6)
- 3(1). Coxa II with large, broadly rounded ventral spur and with broad ridge on posterior margin; posterior margin of sternal shield slightly convex to slightly concave 4
 Coxa II with ventral spur variable but not large and broadly rounded, and without broad ridge on posterior margin (however, a distinct posteromarginal spur may be present); posterior margin of sternal shield slightly concave to deeply concave (invaginated from level of setae st. 3 to level of first pair of pores) 6
- 4(3). Posterior margin of sternal shield slightly convex to sinuous; genital shield relatively narrow and narrowly rounded posteriorly; coxa IV without spur
 *H. heteromydis* Strandtmann and Yunker (p. 8)
 Posterior margin of sternal shield slightly concave (invaginated to level of setae st. 3); genital shield not unusually narrow; genital shield broadly rounded posteriorly; coxa IV with spur 5
- 5(4). Dorsal setae extremely minute; sternal shield less than twice as wide as long; spurs of coxae III and IV small; anal shield circular *H. minutus* Strandtmann and Yunker
 Dorsal setae medium in size; sternal shield more than twice as wide as long; spurs of coxae III and IV medium to large; anal shield pyriform
 *H. panamanensis* Strandtmann and Yunker
- 6(3). Posterior margin of sternal shield moderately to very deeply concave (invaginated from level of setae st. 2 to level of first pair of pores); ventral spurs of coxae II and III medium to large and usually acute (medium-sized spurs may be blunt); setae av_1 and pv_1 of tarsus II stout and clawlike and/or setae av_1 of tarsus IV bluntly or acutely spiniform 7
 Posterior margin of sternal shield slightly to moderately concave (invaginated from level of setae st. 3 to level of setae st. 2); spur of coxa II (when present) small and narrowly to broadly rounded; setae av_1 and pv_1 of tarsus II never stout and clawlike, and setae av_1 of tarsus IV never spiniform 11
- 7(6). Setae av_1 and pv_1 of tarsus II normal, not stout and clawlike; setae av_1 of tarsus IV acutely or bluntly spiniform; coxa IV with medium-sized acute spur; posterior margin of sternal shield deeply concave (invaginated almost to level of first pair of pores) 8
 Setae av_1 and pv_1 of tarsus II stout and clawlike; setae av_1 of tarsus IV not spiniform, at most slightly enlarged basally; coxa IV with or without spur; posterior margin of sternal shield moderately to rather deeply concave (invaginated from level of setae st. 2 to level halfway to first pair of pores) 9
- 8(7). Without distinct posteromarginal spur on coxa II; setae av_1 of tarsus IV bluntly spiniform; sternal setae st. 2 set distinctly closer to st. 3 (distance between st. 1 and st. 2 almost twice that between st. 2 and st. 3). (Fig. 6-8)
 *H. keenani* Strandtmann and Yunker (p. 9)
 With elongate, blunt posteromarginal spur on coxa II; setae av_1 of tarsus IV acutely spiniform; sternal setae st. 2 only slightly closer to st. 3 than to st. 1. (Fig. 14-16) *H. brachysternum* n. sp. (p. 12)
- 9(7). Posterior margin of sternal shield rather deeply concave (invaginated to level halfway between setae st. 2 and first pair of pores); setae JvI set on posterolateral margin of genital shield; coxa IV without spur; dorsal setae r2 and s3 absent; posterior end of dorsal shield broadly rounded. (Fig. 20-22) ... *H. dorsolatus* n. sp. (p. 15)
 Posterior margin of sternal shield moderately concave (invaginated from level of setae st. 2 to level slightly anterior to setae st. 2); setae JvI not set on margin of genital shield, at most only touches margin; coxa IV with or without spur; all 26 pairs of dorsal setae present and medium sized; posterior end of dorsal shield narrowly rounded or broad, bluntly wedge shaped 10

- 10(9). Coxa IV without spur; ventral spur of coxa II small and blunt; greatest width of dorsal shield at level of setae s4, with lateral sides converging posteriorly; posterior end of dorsal shield narrowly rounded; anal shield broadly pyriform. (Fig. 23-25) *H. rhipidomys* n. sp. (p. 17)
- Coxa IV spur long and slender; ventral spur of coxa II medium sized and acute; greatest width of dorsal shield at level of setae Z1, with lateral sides slightly converging anteriorly; posterior end of dorsal shield broad, bluntly wedge shaped; anal shield narrowly pyriform *H. butantanensis* (Fonseca) (p. 20)
- 11(6). Posterior margin of sternal shield only slightly concave (invaginated from level of setae st. 3 to level of second pair of pores); posterolateral projections of sternal shield weak, slender, and attached or unattached to margin of shield; anal shield broadly pyriform to near circular 12
- Posterior margin of sternal shield moderately concave (invaginated from level of second pair of pores to level of setae st. 2); posterolateral projections of sternal shield robust (may be slender), and always attached to margin of shield; anal shield narrowly to broadly pyriform 14
- 12(11). Coxa IV with medium-sized, broad, acute spur; anal shield almost circular; posterolateral projections of sternal shield slender, attached to margin of shield; spurs of coxae II and III medium sized and rather broadly rounded; chelicerae long and slender, with movable chela at most one-sixth the length of second cheliceral segment *H. microchela* Strandtmann and Yunker
- Coxa IV without spur; anal shield broadly pyriform; posterolateral projections of sternal shield weak and detached from margin of shield; spurs of coxae II and III variable; chelicerae normal, movable chela at least one-third as long as second cheliceral segment 13
- 13(12). Coxa II without ventral spur or at most with broad indistinct apophysis; sternal shield less than three times as wide as long; greatest width of dorsal shield at level of setae s4, with lateral sides converging posteriorly. (Fig. 29-30)..... *H. venezuelensis* n. sp. (p. 20)
- Coxa II with small to medium-sized and narrowly rounded ventral spur; sternal shield more than three times as wide as long; lateral sides of dorsal shield nearly parallel (may be slightly wider at level of setae Z1). (Fig. 36-37) *H. brevicealcar* n. sp. (p. 24)
- 14(11). Coxa II without ventral spur or at most with medium-sized broad apophysis; ventral setae Jv1 on posterolateral margins of genital shield; movable chela one-half as long as second cheliceral segment; larger size. (Fig. 43-44) *H. galindoi* Strandtmann and Yunker (p. 28)
- Coxa II with distinct ventral spur, small to medium sized, and narrowly rounded; ventral setae Jv1 not on margin of genital shield, but separated from margin by distance greater than setal base diameter; movable chela less than one-half as long as second cheliceral segment; smaller size. (Fig. 47-48) . *H. parvisoma* n. sp. (p. 30)

Males

1. Coxal spur formula always 0-3-2-1; coxa II with distinct posteromarginal spur in addition to usual ventral spur 2
- Coxal spur formula usually 0-2-2-1 or 0-1-2-1 (except in *H. brachy sternum* which may have posteromarginal spur on coxa II); coxa II without distinct posteromarginal spur (except possibly in *H. brachy sternum*) and with or without usual ventral spur 5
- 2(1). Anal portion of holovenral shield greatly expanded laterally, with cribrum subtending posterior margin as a crescentic band; ventral spur of coxa II medium sized and acute to blunt 3
- Anal portion of holovenral shield normal, not greatly expanded, and with narrow

	terminal cribrum; ventral spur of coxa II large and very broadly rounded to truncate	4
3(2).	Twenty-eight pairs of minute setae on dorsal shield; setae of coxae II and III acutely spiniform	<i>H. lunatus</i> Strandtmann and Yunker
	Thirty-two or 33 pairs of medium-sized setae on dorsal shield; only anterior seta of coxa II acutely spiniform. (Fig. 3-5)	<i>H. proctolatus</i> n. sp. (p. 6)
4(2).	Holovenal shield very narrow posterior to coxa IV (width less than distance between coxae IV); shield markedly constricted anterior to anal portion (width less than or equal to distance between setae Jv2)	<i>H. heteromydis</i> Strandtmann and Yunker (p. 8)
	Holovenal shield moderately expanded posterior to coxa IV (width greater than distance between coxae IV); shield not markedly constricted anterior to anal portion (width greater than distance between setae Jv2)	<i>H. minutus</i> Strandtmann and Yunker
5(1).	Ventral spurs of coxae II and III medium sized and acute; dorsal shield with no more than three setae of R series on posterolateral margins	6
	Ventral spur of coxa II absent or at most small and rounded; ventral spur of coxa III small to medium sized and acute to rounded; dorsal shield with more than 3 setae (usually 6 to 16) of R series on posterolateral margins	9
6(5).	Dorsal shield with three pairs of setae of R series on posterolateral margins. (Fig. 17-19)	<i>H. brachyternum</i> n. sp. (p. 12)
	Dorsal shield without or at most with one pair of setae of R series on posterolateral margins	7
7(6).	Posterior end of dorsal shield broad, blunt, wedge shaped; only two setae of r series (r2 and r3) on anterolateral margins; no setae of R series on posterolateral margins. (Fig. 9-11)	<i>H. keenani</i> Strandtmann and Yunker (p. 9)
	Posterior end of dorsal shield rather broadly rounded; two or three setae of r series (r2, r3, and frequently r4) on anterolateral margins; at most only one pair of setae of R series on posteromarginal margins	8
8(7).	Dorsal setae S3 absent; with three pairs of setae of r series (r2, r3, and r4) on anterolateral margins; no setae of R series on posterolateral margins; lateral margins of dorsal shield nearly straight, with greatest width at level of setae s4; setae Z5 and S5 at least twice as long as central setae (J1, J2, and J3); holovenal shield moderately expanded posterior to coxa IV (width greater than distance between coxae IV). (Fig. 26-28)	<i>H. rhipidomys</i> n. sp. (p. 17)
	Dorsal setae S3 present, with two pairs of setae of r series (r2 and r3) on anterolateral margins; frequently with one pair of setae of R series on posterolateral margins; lateral margins of dorsal shield distinctly concave, with greatest width at level of setae S1; setae Z5 and S5 subequal in length to central setae; holovenal shield only slightly expanded posterior to coxa IV (width less than distance between coxae IV)	<i>H. butantanensis</i> (Fonseca) (p. 20)
9(5).	Coxal spur formula 0-2-2-1; ventral spur of coxa II small and rounded; holovenal shield very broad between coxae, with width posterior to coxa IV no greater than distance between coxae IV; greatest width of dorsal shield distinctly at level of setae s4, with lateral sides converging posteriorly; setae av ₂ and av ₃ of tarsus II normal, not basally enlarged. (Fig. 38-40)	<i>H. brevicelear</i> n. sp. (p. 24)
	Coxal spur formula 0-1-2-1; ventral spur of coxa II absent; holovenal shield narrower between coxae, with width posterior to coxa IV greater than distance between coxae IV; lateral sides of dorsal shield straight to slightly concave and nearly parallel; setae av ₂ and sometimes av ₃ of tarsus II basally enlarged	10
10(9).	Posterolateral margins of dorsal shield bears from 10 to 16 pairs of setae of R series; setae av ₂ and av ₃ both bulbous basally; movable chela half as long as second cheliceral segment; larger size. (Fig. 31-33)	<i>H. venezuelensis</i> n. sp. (p. 20)

Posterolateral margins of dorsal shield bears from four to six pairs of setae of R series; seta av_2 of tarsus II greatly enlarged and almost spiniform, but seta av_3 normal; movable chela only one-third as long as second cheliceral segment; smaller size. (Fig. 49-51) *H. parvisoma* n. sp. (p. 30)

Subgenus *Hirstionyssus* Herrin, 1970

Hirstionyssus (*H.*) *proctolatus* n. sp. Fig. 1-5.

DIAGNOSIS: The coxal spur formula for females is 0-3-3-2; all spurs are moderate in size and blunt to narrowly rounded. The most distinguishing character of both females and males is the broad, laterally angulate anal shield with small paranal setae. Other diagnostic characters of females are the row of cuticular spurlike processes on the distal margins of trochanters III and IV and on femora III and IV, and the generally truncate posterior margin of the sternal shield, with $Jv1$ setae on the posterolateral margins. In males the holovenral shield is very wide between the coxae and is expanded considerably posterior to coxa IV. The dorsal shield covers the entire dorsum.

DESCRIPTION, HOLOTYPE FEMALE: Fig. 1-2.

Legs. Coxal spur formula 0-3-2-2; ventral spurs of coxae II and III medium sized (length 10-12 μm ; basal width 7-8 μm) and blunt; posteromarginal spur of coxa II medium sized (length ca. 5 μm ; basal width 8-10 μm) and blunt; posteromarginal spur of coxa III small (length 6-8 μm ; basal width 5-6 μm) and blunt; anterior setae of coxa III robust and acutely spiniform; posteroventral spur of coxa IV small, broad, and blunt; additional broad, blunt spur on anteroventral margin of coxa IV. Trochanters III and IV and femora III and IV with row of four to six small cuticular spurlike processes on distal margins; lateroventral margins of genera III and IV serrated. Setae av_1 and pv_1 of tarsus II normal, not stout and clawlike; usual leg setae present and normal.

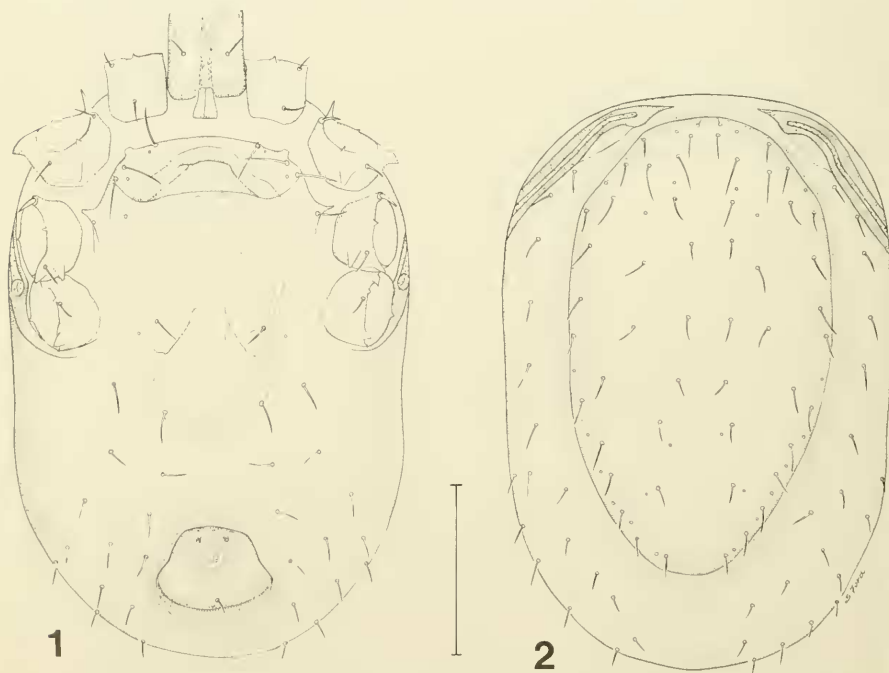


Fig. 1-2. *H. proctolatus* n. sp., female. (1) venter; (2) dorsum, scale = 100 μm .

Venter. Anterior margin of sternal shield moderately convex; posterior margin slightly concave (invaginated only to level posterior to setae st. 3); anterolateral projections short and broad; posterolateral projections long and narrow; sternal setae st. 2 very close to st. 3. Genital shield nearly rectangular; lateral sides only slightly convex and parallel; posterior margin only slightly convex; line formed by end of genital flap ribs moderately arched; Jv1 setae on posterolateral margin of genital shield. Anal shield broad, distinctly wider than long, with angulate lateral margins and short, broad cribrum; anal orifice located near anterior margin; paranal setae at level near anterior end of anal field. Soft integument of venter bears about 13 pairs of medium-sized (length 15-17 μm) opisthogastric setae. Peritreme of uniform width, except slightly wider posteriorly; extends anteriorly to level of posterior third of coxa I.

Dorsum. Greatest width of dorsal shield at level of setae s3 or s4; lateral margins slightly convex, converging posteriorly; posterior end narrowly rounded; 26 pairs of medium-sized (length 15-19 μm) normally developed setae.

Measurements. Dorsal shield length 281 μm ; greatest width 164 μm . Peritreme length 133 μm . Sternal shield length 26 μm ; width 86 μm . Genital shield length 60 μm ; greatest width 74 μm . Anal shield length 41 μm ; greatest width 59 μm . Length of tarsi: I - 46 μm ; II - 45 μm ; III - 43 μm ; and IV - 50 μm . Length of movable chela 37 μm ; length of second cheliceral segment 101 μm .

ALLOTYPE MALE: Fig. 3-5.

Legs. Coxal spur formula 0-3-2-1; ventral spurs of coxae II and III small (lengths 5-6 μm ; basal width 5-6 μm) and narrowly rounded; posteromarginal spur of coxa II small (length 2-4 μm ; basal width 6-7 μm) and rather broadly rounded; posteromarginal spur of coxa III small to medium sized (length 7-8 μm ; basal width 3-4 μm), slender, and acute; posteroventral spur of coxa IV small (length 5-6 μm ; basal width 3-4 μm) and acute. Setae av₁ and pv₁ of tarsus II stout and clawlike; usual leg setae present and normally developed.

Venter. Hololeventral shield broad throughout, filling entire venter between coxae; greatly expanded posterior to coxa IV; narrowed at level of paranal setae; and considerably expanded in anal area, with cribrum short and broad; bearing usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opisthogastric setae (Zv1, Jv1, and Jv2), 1 pair of small paranal setae, and single postanal seta; paranal setae at

level of anterior end of anal field. Soft integument of venter bears about 11 pairs of medium-sized (length 15-17 μm) opisthogastric setae. Peritreme rather narrow throughout although slightly wider posteriorly; extends anteriorly to level of middle of coxa I.

Dorsum. Dorsal shield covers almost entire dorsum; greatest width at level of setae s4; lateral sides nearly straight and gradually converging posteriorly; posterior end broadly rounded. Usual 26 pairs of dorsal setae present, as in females, plus first 3 setae of r series (r2, r3, and r4), and 3 or 4 pairs of setae of R series which, in females, are always on soft integument; all dorsal setae medium sized (length 10-12 μm).

Measurements. Dorsal shield length 378 μm ; greatest width 234 μm . Peritreme length 176 μm . Hololeventral shield length 274 μm ; anterior width 102 μm ; greatest width posterior to genital setae 117 μm ; width at level of middle of anal field 94 μm . Length of tarsi: I - 66 μm ; II - 62 μm ; III - 70 μm ; and IV - 70 μm . Length of movable chela 35 μm ; length of second cheliceral segment 58 μm .

DEUTONYMPH: Unknown.

TYPE MATERIAL: Holotype female, allotype male, one paratype female and one paratype male (SVP-42683) from *Heteromyia anomalus*, El Rosario (54 m), 48 km WNW Encontrados, Zulia, Venezuela, April 1, 1968, by A. L. Tuttle, et al. One paratype female (SVP-14835) from *Carollia perspicillata*, nr. La Pastora (122 m), 14 km ENE Mirimiri, Falcón, Venezuela, November 11, 1967, by N. E. Peterson, et al. Additional material examined: one male (SVP-42680) with same collection data as holotype female. One female (281070-03) from *Oryzomyia caliginosus*, Hda. El Nus, 11 km S and 30 km E Cisneros, Antióquia, Colombia, October 28, 1970, by N. E. Peterson.

REMARKS: This species closely resembles *H. lunatus* Strandmann and Yunker (1966) from Panamá, but differs in the following respects: ventral spurs of coxae II and III somewhat longer; anterior and posterior setae of coxae II normal, not acutely spiniform; all leg setae, ventral opisthogastric setae and dorsal opisthosomal setae normal, not short and spiniform; sternal shield smaller, shorter, and only slightly invaginated posteriorly; genital shield of female more rectangular in shape, and lateral sides and posterior margin less convex; in females posterior end of dorsal shield more narrowly rounded; dorsal setae of both sexes much longer; in female setae J1 present, and setae r2 separated from margin of dorsal shield. The principal

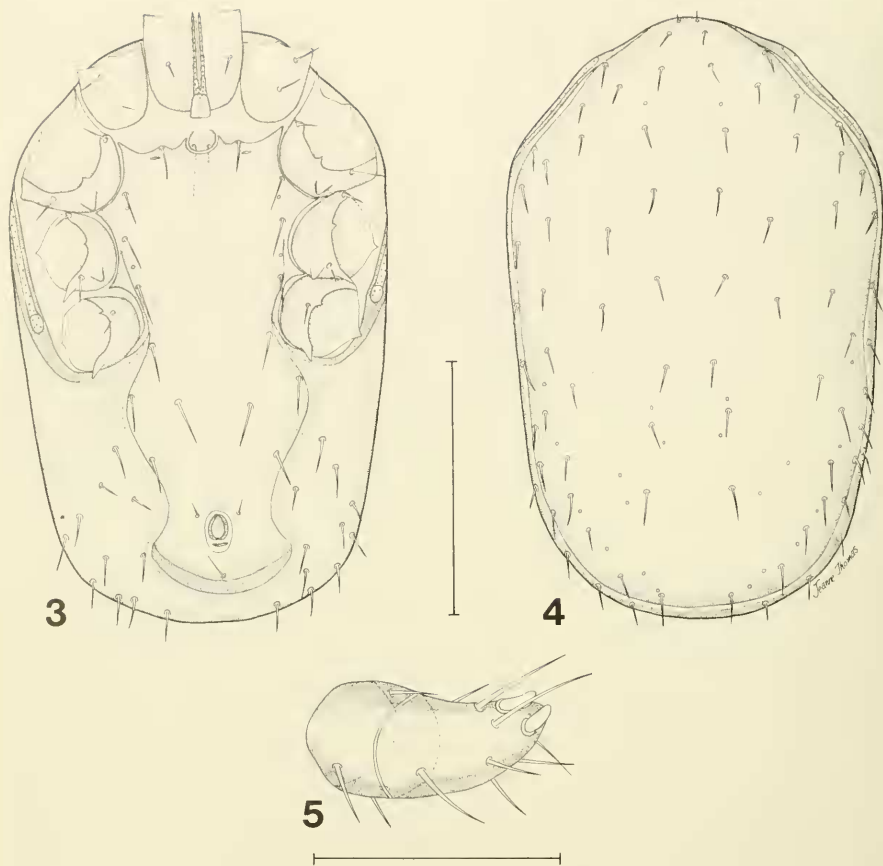


Fig. 3-5. *H. proctolatus* n. sp., male. (3) venter; (4) dorsum, scale = 100 μ m; (5) ventral view of tarsus II, scale = 50 μ m.

hosts of *H. lunatus* from Panamá and *H. proctolatus* of Venezuela are heteromyid rodents, *Heteromys desmarestianus* and *H. anomalus*, respectively. Strandmann and Yunker (1966) reported six females and one male of *H. lunatus* from two collections of *H. desmarestianus* in Panamá. In the present study, two females and two males of *H. proctolatus* were taken from a single *Heteromys anomalus*. The one female

specimen recorded from the bat, *Carollia perspicillata* may represent a laboratory contamination or confusion of labels.

Hirstionyssus (*H.*) *heteromydis* Strandmann and Yunker, 1966.

The original descriptions and illustrations given by Strandmann and Yunker (1966) are

quite sufficient. Thus, only the new collection records for this species are presented here.

NEW RECORD: 11 females, 7 males, and 2 deutonymphs from *Heteromys* sp. (probably *H. desmarestianus*) at Cuacamallo, British Honduras, September 25, 1963, by D. J. Lewis (specimens loaned by the British Museum, Natural History). Previously known only from Panamá.

Hirstionyssus (*H.*) *keenani* Strandtmann and Yunker, 1966. Fig. 6-13.

A detailed description of the female will not be given here because the original description by

Strandtmann and Yunker (1966) is adequate. However, a representative specimen from the Venezuela collection has been illustrated. Strandtmann and Yunker (1966) found no males in the Panamá material and, although they illustrated parts of a deutonymph, no description was given. Thus, descriptions and illustrations of the male and the deutonymph are given below. No significant differences were noted between the Venezuela specimens and paratypes from Panamá. Measurements of a female *H. keenani* from Venezuela are given for comparison with other closely related species described here.

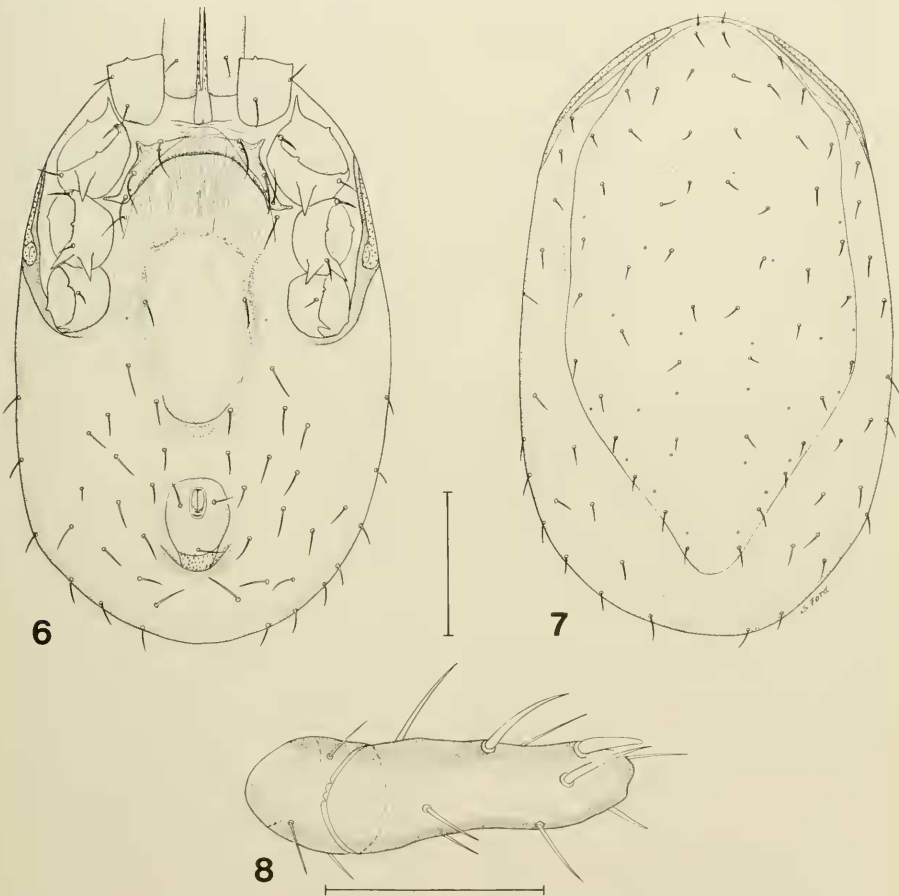


Fig. 6-8. *H. keenani* Strandtmann and Yunker, female. (6) venter; (7) dorsum, scale = 100 μ m; (8) ventral view of tarsus IV, scale = 50 μ m.

DIAGNOSIS: The coxal spur formula for females and males is 0-2-2-1; all spurs are medium to large, slender, and acute, although larger in females than in males. Setae av_1 and pv_1 of tarsus II are stout and clawlike only in males. Seta av_1 of tarsus IV is bluntly spiniform in females but not in males. The sternal shield of females is deeply concave posteriorly (invaginated to level just posterior to the first pair of pores). The dorsal shield of females is widest at the level of setae Z1, its lateral sides are slightly concave, and its posterior end is narrow and sharply wedge shaped. In males the lateral sides of the dorsal shield are nearly parallel, with the posterior end narrowly rounded. The dorsal shield of both sexes bears the usual 26 pairs of small to medium-sized setae, plus setae r2 and r3 in males.

FEMALE: Fig. 6-8.

Measurements. Dorsal shield length 465 μm ; greatest width 255 μm . Peritreme length 207 μm . Sternal shield length 11 μm ; width 104 μm . Genital shield length 108 μm ; greatest width 96 μm . Anal shield length 63 μm ; greatest width 62 μm . Length of tarsi: I - 75 μm ; II - 74 μm ; III - 73 μm ; and IV - 89 μm . Length of movable chela 46 μm ; length of second cheliceral segment 94 μm .

MALE: Fig. 9-11.

Legs. Coxal spur formula 0-2-2-1; ventral spurs of coxae II, III, and IV medium sized (length 10-13 μm ; basal width 6-8 μm), rather slender and acute; no posteromarginal spur on coxa II. Setae av_1 and pv_1 of tarsus II stout and clawlike; some ventral setae of tarsi II to IV may be somewhat hypertrophied basally; usual leg setae present and normally developed.

Venter. Holoventral shield normal for genus; slightly expanded posterior to genital setae and with only slight constriction anterior to anal field; bears usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opistogastric setae (Zv1, Jv1, and Jv2), 1 pair of paranal setae, and single postanal seta; paranal setae at level slightly anterior to middle of anal field. Soft integument of venter bears 17 or 18 pairs of medium-sized (length 20-24 μm) opistogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of middle of coxa I.

Dorsum. Lateral sides of dorsal shield straight and parallel; posterior end narrowly rounded. Twenty-six pairs of usual dorsal setae present as in females, plus first two setae of r series (r2 and r3); remaining three pairs of setae of r series (r4, r5, and r6), and all setae of R series, set laterally on soft integument; central

dorsal setae small in size (length 8-10 μm), but marginal setae, especially anteromarginal and posteromarginal, medium sized (length 17-19 μm).

Measurements. Dorsal shield length 394 μm ; greatest width 214 μm . Peritreme length 189 μm . Holoventral shield length 285 μm ; anterior width 84 μm ; greatest width posterior to genital setae 97 μm ; width at level of middle of anal field 55 μm . Length of tarsi: I - 61 μm ; II - 56 μm ; III - 52 μm ; and IV - 72 μm . Length of movable chela 34 μm ; length of second cheliceral segment 67 μm .

DEUTONYMPH: Fig. 12-13.

Legs. Coxal spur formula 0-2-1-0; ventral spurs of coxae II and III medium sized (length 7-8 μm ; basal width 6-7 μm) and acute to slightly blunt; no posteromarginal spurs on coxae; usual leg setae present and normally developed.

Venter. Sternal shield bears 4 pairs of setae and 3 pairs of circular pores; anterior margin moderately convex; lateral margins moderately concave between setae st. 1 and 2; posterior end narrowly rounded between genital setae. Anal shield small and pyriform in general shape; paranal setae at level of anterior end of anal field. Soft integument of venter bears genital setae plus 17 or 18 pairs of opistogastric setae; ventral setae medium sized (length 12-17 μm), with sternal setae slightly longer than opistogastric setae. Peritreme of uniform width throughout; extends anteriorly to level between coxae II and III.

Dorsum. Greatest width of dorsal shield at level of setae s3 or s4; anterolateral margins nearly straight; lateral margins slightly convex and converging posteriorly; posterior end narrowly rounded. Usual 26 pairs of dorsal shield setae present and rather small (length 8-10 μm), except setae Z5 (length ca. 31 μm), which is three or four times as long as adjacent setae (s5); all 5 pairs of setae of r series present laterally on soft integument, and 14 to 16 pairs of small setae (length 8-9 μm) posterolaterally on soft integument.

Measurements. Dorsal shield length 283 μm ; greatest width 144 μm . Peritreme length 144 μm . Sternal shield length 145 μm ; width 60 μm . Anal shield length 31 μm ; greatest width 34 μm . Length of tarsi: I - 53 μm ; II - 49 μm ; III - 43 μm ; and IV - 63 μm . Length of movable chela 36 μm ; length of second cheliceral segment 73 μm .

MATERIAL EXAMINED: One female (SVP-13784) from *Heteromys anomalus*, San Agustín (1108m), 5 km NW Caripe, Monagas, Venezue-

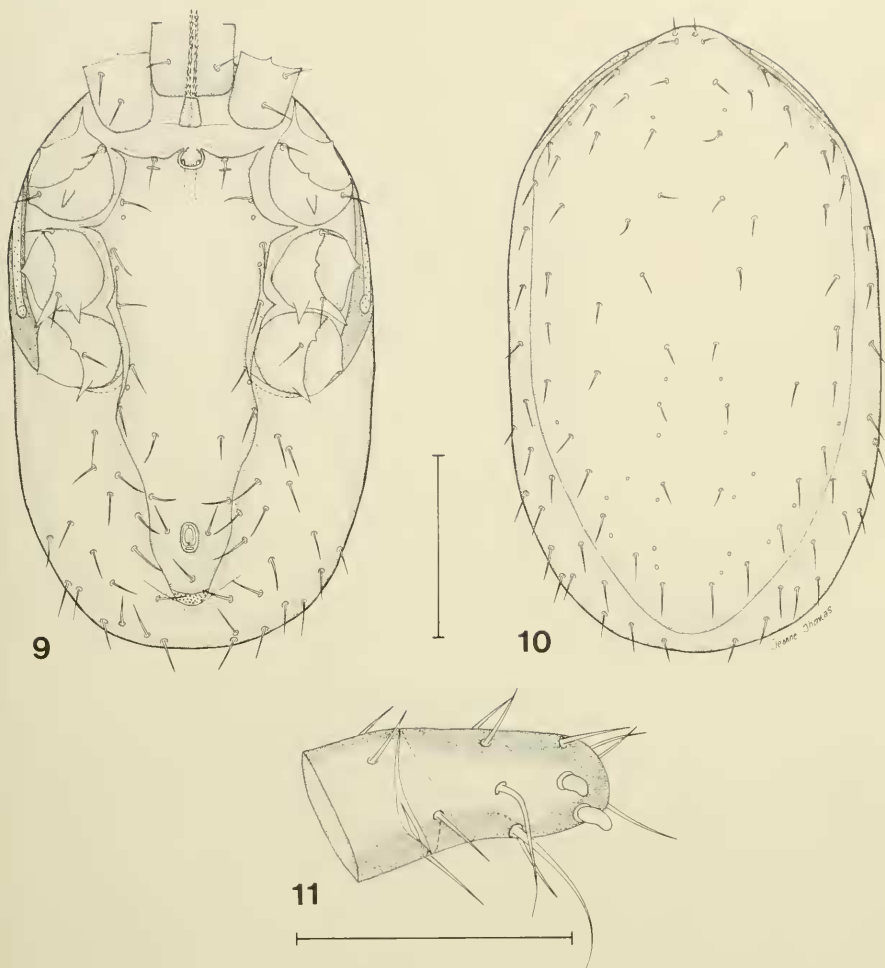


Fig. 9-11. *H. keenani* Strandmann and Yunker, male. (9) venter; (10) dorsum, scale = 100 μ m; (11) ventral view of tarsus II, scale = 50 μ m.

la, June 29, 1967, by N. E. Peterson et al.; one female (SVP-33275) from *Sciurus granatensis*, Altamira (794m), Barinas, Venezuela, December 18, 1967, by A. L. Tuttle et al.; one female, one male, and one deutonymph (SVP-34261) from *Sciurus granatensis*, Altamira (600m), Barinas, Venezuela, January 6, 1968, by A. L. Tuttle, et al.; two females (SVP-34265) from *Sciurus granatensis*, Altamira (600m), Barinas, Venezuela, January 7, 1968, by A. L. Tuttle, et al.; one female and one deutonymph (SVP-

35444) from *Sciurus granatensis*, La Trinidad (900m), 9km NW Montalbán, Carabobo, Venezuela, August 4, 1968, by A. L. Tuttle, et al.; one female (SVP-40956) from *Sciurus granatensis*, Nultia (24m), 3km N Nula, Apure, Venezuela, February 14, 1968, by A. L. Tuttle, et al.; and four females and two deutonymphs (SVP-41311) from *Sciurus granatensis*, El Rosario (50m), 51km WNW Encontrados, Zulia, Venezuela, March 2, 1968, by A. L. Tuttle, et al.

In addition to the Venezuela material, the

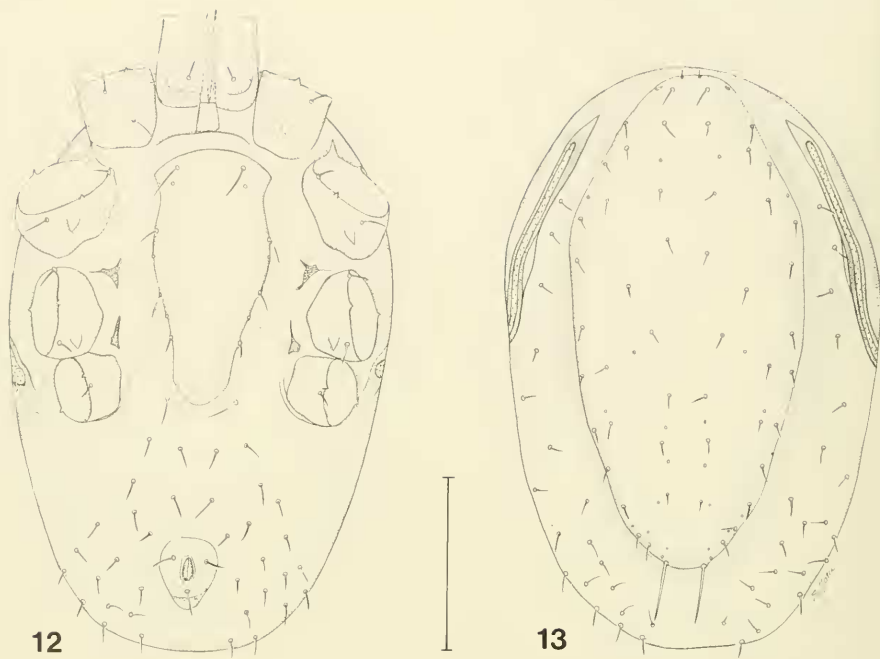


Fig. 12-13. *H. keenani* Strandmann and Yunker, deutonymph. (12) venter; (13) dorsum, scale = 50 μ m.

following specimens from Panamá were used in comparisons: two paratype females (RML 40108) from *Sciurus variegatoides*, Gamboa, Canal Zone, Panamá, December 4, 1960, by N. Gale; one female (RML 44623) from *Sciurus variegatoides*, Ancón, MARU, Canal Zone, Panamá, March 12, 1962, by C. E. Yunker; and one deutonymph (RML 40795) from *Sciurus granatensis*, Martínez Dairy, Cerro Punta, Chiriquí, Panamá, May 2, 1966, by C. E. Yunker.

REMARKS: The specimens of *H. keenani* from Venezuela and Panamá are almost identical, differing only slightly in some characters, well within the range of intraspecific variation. In both countries, the preferred hosts of *H. keenani* are squirrels of the genus *Sciurus*. It was collected from *Sciurus granatensis* in both Panamá and Venezuela and from *S. variegatoides* in Panamá.

Hirstionyssus (H.) brachysternum n. sp. Fig. 14-19.

DIAGNOSIS: The coxal spur formula for both sexes is typically 0-3-2-1, but the only male

specimen lacks the posteromarginal spur on the right coxa II; all spurs are medium to large and acute, although ventral spurs of coxae II and III are larger and more acute in females than in the males. The sternal shield of females is deeply concave posteriorly, invagination extending to the level of the first pair of sternal pores. The dorsal shield of females is widest at the level of setae Z1, with the lateral sides straight to slightly concave, and with the posterior end narrow, sharply wedge shaped. The greatest width of the male dorsal shield is at the level of setae s4, its lateral sides are slightly concave, and its posterior end is narrowly rounded. The dorsal shield of females bears the usual 26 pairs of setae, but an additional 5 or 6 pairs are present in the male (r2, r3, and usually r4 plus 3 pairs of R series).

DESCRIPTION, HOLOTYPE FEMALE: Fig. 14-16.

Legs. Coxal spur formula 0-3-2-1; ventral spurs of coxae II and III large (length 23-26 μ m; basal width 12-13 μ m) and acute; posteromarginal spur of coxa II medium sized (length 12-13 μ m; basal width 6-7 μ m), narrow, and

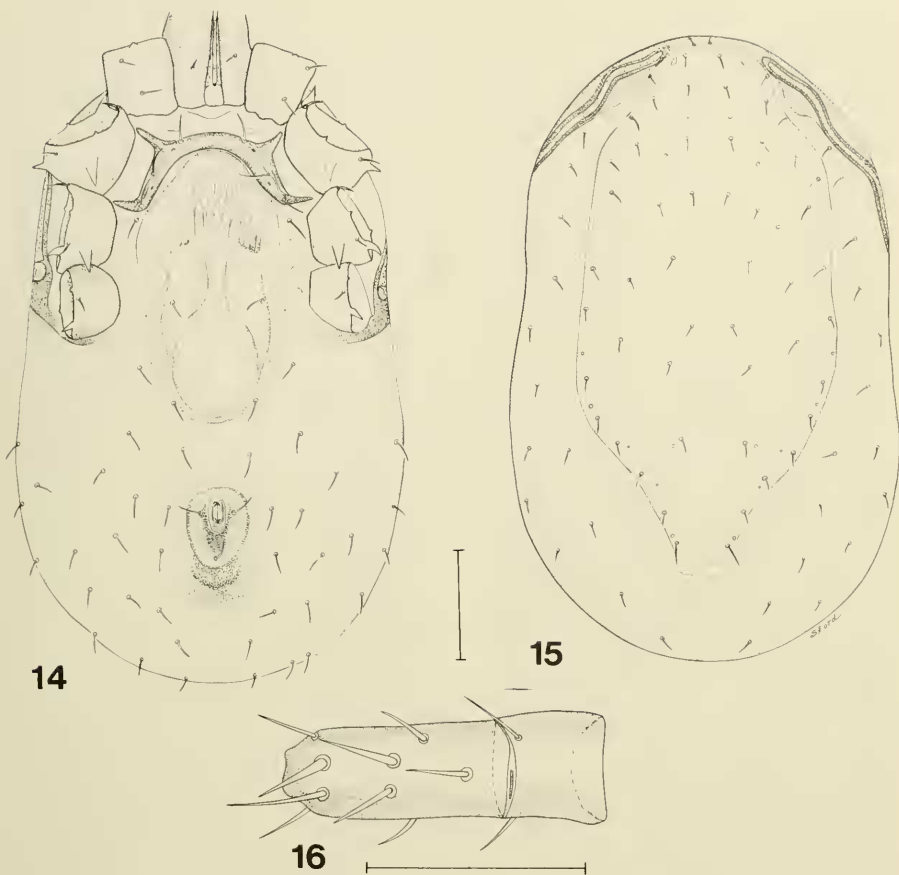


Fig. 14-16. *H. brachysternum* n. sp., female. (14) venter; (15) dorsum, scale = 100 μ m; (16) ventral view of tarsus IV, scale 50 μ m.

acute; posteromarginal spur of coxa III medium sized (length 12-14 μ m; basal width 7-8 μ m) and acute; posteroventral spur of coxa IV long (length 10-12 μ m; basal width ca. 5 μ m), slender, and acute. Setae av_1 and pv_1 of tarsus II normal, not stout and clawlike; setae av_1 of tarsus IV acutely spiniform; some ventral setae of femur IV, genu IV, tibia IV, and tarsus IV enlarged somewhat but not spiniform; usual leg setae present and normal.

Venter. Anterior margin of sternal shield slightly convex; posterior margin extremely concave (invaginated to level of first pair of pores); anterolateral and posterolateral projections long and narrow; setae st. 2 slightly closer to st. 3

than to st. 1. Genital shield slightly expanded posterior to genital setae and rounded posteriorly; line formed by end of genital flap ribs slightly arched; setae ju_1 on soft integument but often touching margin of genital shield. Anal shield pyriform with paranal setae at level of middle of anal field. Soft integument of venter bears 20 to 22 pairs of medium-sized (length 15-17 μ m) opisthogastric setae. Peritreme of uniform width except slightly wider posteriorly; extends to level of middle of coxa I or slightly beyond.

Dorsum. Greatest width of dorsal shield at level of setae Z1 or S1; lateral sides straight to slightly concave and gradually converging an-

teriorly; posterior end narrow, sharply wedge shaped; bears usual 26 pairs of setae with central setae smaller (length 8-9 μm) than marginal (length 12-16 μm). Five pairs of setae of r series laterally on soft integument, and 8 to 10 pairs of opisthosomal setae posterolaterally on soft integument.

Measurements. Dorsal shield length 456 μm ; greatest width 218 μm . Peritreme length 211 μm . Sternal shield length 10 μm ; width 96 μm . Genital shield length 106 μm ; greatest width 96 μm . Anal shield length 60 μm ; greatest width 55 μm .

Length of tarsi: I - 62 μm ; II - 53 μm ; III - 58 μm ; and IV - 70 μm . Length of movable chela 44 μm ; length of second cheliceral segment 101 μm .

ALLOTYPE MALE: Fig. 17-19.

Legs. Coxal spur formula 0-2(3)-2-1; ventral spurs of coxae II and III medium sized (length 10-12 μm ; basal width 6-8 μm) and acute to slightly blunt; posteromarginal spur of coxa II small (length 6-7 μm ; basal width ca. 6 μm) and blunt (present only on left coxa II of al-

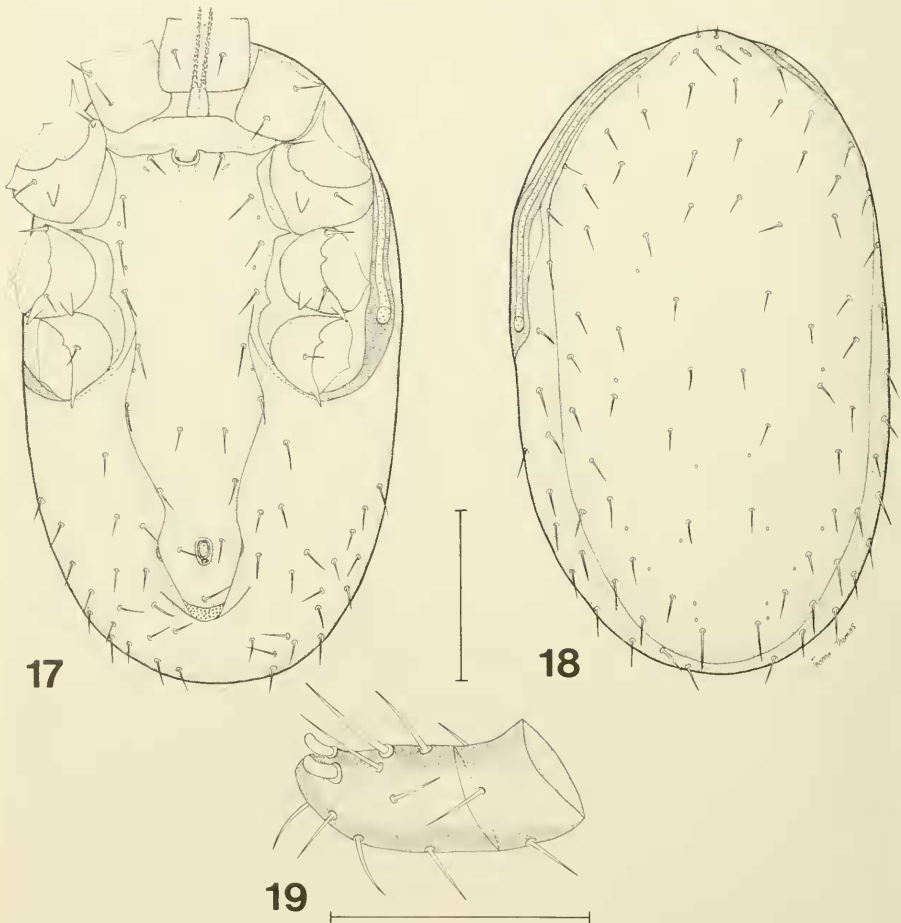


Fig. 17-19. *H. brachysternum* n. sp., male. (17) venter; (18) dorsum, scale = 100 μm ; (19) ventral view of tarsus II, scale = 50 μm .

lotype male); postermarginal spurs of coxae III and IV medium sized (length 10-11 μm ; basal width 4-5 μm) but quite slender and acute. Setae av_1 and pv_1 of tarsus II stout and clawlike; usual leg setae present and normally developed.

Venter. Holoventral shield normal for genus; slightly expanded posterior to genital setae, with moderate constriction anterior to anal field; bears usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opisthogastric setae (Jv1, Jv1, and Jv2), 1 pair of paranal setae, and single postanal seta; paranal setae at level slightly anterior to middle of anal field. Soft integument of venter bears 19 or 20 pairs of medium-sized (length 11-14 μm) opisthogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of middle of coxa I.

Dorsum. Dorsal shield covers almost entire dorsum; greatest width at level of setae s4; lateral sides straight to slightly concave and gradually converging posteriorly; posterior end moderately rounded. Twenty-six pairs of usual dorsal shield setae present, as in female, plus first 2 or 3 pairs of setae of r series (r2, r3 and usually r4) and 3 pairs of setae of R series; soft integument of dorsum bears other 2 pairs of setae of r series (r5 and r6), plus 9 or 10 pairs of setae of R series; dorsal setae small to medium sized, with central dorsal setae smaller (length 7-9 μm) than marginal (length 10-14 μm).

Measurements. Dorsal shield length 358 μm ; greatest width 199 μm . Peritreme length 168 μm . Holoventral shield length 252 μm ; anterior width 79 μm ; greatest width posterior to genital setae 82 μm ; width at level of middle of anal field 49 μm . Length of tarsi: I - 51 μm ; II - 50 μm ; III - 51 μm ; and IV - 65 μm . Length of movable chela 43 μm ; length of second cheliceral segment 72 μm .

DEUTONYMPH: Unknown.

TYPE MATERIAL: Holotype female (SVP-31786) from *Sciurus igniventris*, Raya (135 m), 32 km SSE Puerto Ayacucho, T.F. Amazonas, Venezuela, October 14, 1967, by A. L. Tuttle, et al. Allotype male and one paratype female (SVP-17268) from *S. igniventris*, Boca Mavaca (138 m), 84 km SSE Esmeralda, T.F. Amazonas, Venezuela, March 16, 1967, by M. D. Tuttle, et al. One paratype female, (SVP-15651) from *Carollia perspicillata*, Belén (150 m), Río Cucunuma, 56 km NNW Esmeralda, T.F. Amazonas, Venezuela, January 11, 1967, by M. D. Tuttle, et al.

REMARKS: This species closely resembles *H. keenani*, but differs in the following characters

of the female: presence of a distinct postermarginal spur on coxa II, setae av_1 of tarsus IV not bluntly spiniform (at most somewhat enlarged basally or possibly acutely spiniform), and posterior margin of sternal shield more deeply invaginated. In the male, in addition to having the postermarginal spur on coxa II, the dorsal shield bears three or four pairs of setae of R series on posterolateral margin, and the posterior end of the dorsal shield is more broadly rounded.

Both *H. brachysternum* and *H. keenani* are recorded from squirrels of the genus *Sciurus*, but the hosts are of different species (*S. granatensis* for *H. keenani* and *S. igniventris* for *H. brachysternum*). Records of *H. keenani* from the pocket mouse, *Heteromys anomalus*, and *H. brachysternum* from the fruit bat, *Carollia perspicillata*, may represent laboratory contaminations or confusion of labels. Except for the postermarginal spur on coxa II of *H. brachysternum*, both *H. brachysternum* and *H. keenani* are quite similar to several species of Herriin's (1970) "Scurid host group" of Nearctic *Hirstionyssus* mites.

Hirstionyssus (H.) dorsolatus n. sp. Fig. 20-22.

DIAGNOSIS: The coxal spur formula of females is 0-2-2-0, the ventral spurs of coxae II and III are medium to large and acute, and the postermarginal spur of coxa III is small and acute. Setae av_1 and pv_1 of tarsus II are stout and clawlike. The posterior margin of the sternal shield is deeply concave (invaginated to level between setae st. 2 and first pair of pores). The genital shield is rather broadly rounded posteriorly, and its lateral margins are slightly expanded posterior to the genital setae. Setae Jv1 are on the posterolateral margins of the shield. The dorsal shield covers almost the entire dorsum, its greatest width is at the level of setae Z1, its lateral margins are slightly concave and gradually converging anteriorly, and its posterior end is broadly rounded. Dorsal setae r2 and s3 are absent, resulting in 25 pairs of setae on the dorsal shield. Four pairs of setae of the r series are present laterally on the soft integument.

DESCRIPTION, HOLOTYPE FEMALE: Fig. 20-22.

Legs. Coxal spur formula 0-2-2-0; ventral spur of coxa II large (length 27-31 μm ; basal width 16-18 μm) and acute; postermarginal spur of coxa II absent; ventral spur of coxa III medium sized (length 19-21 μm ; basal width 8-10 μm) and acute; postermarginal spur of coxa III small (length 7-9 μm ; basal width 6-7 μm) and

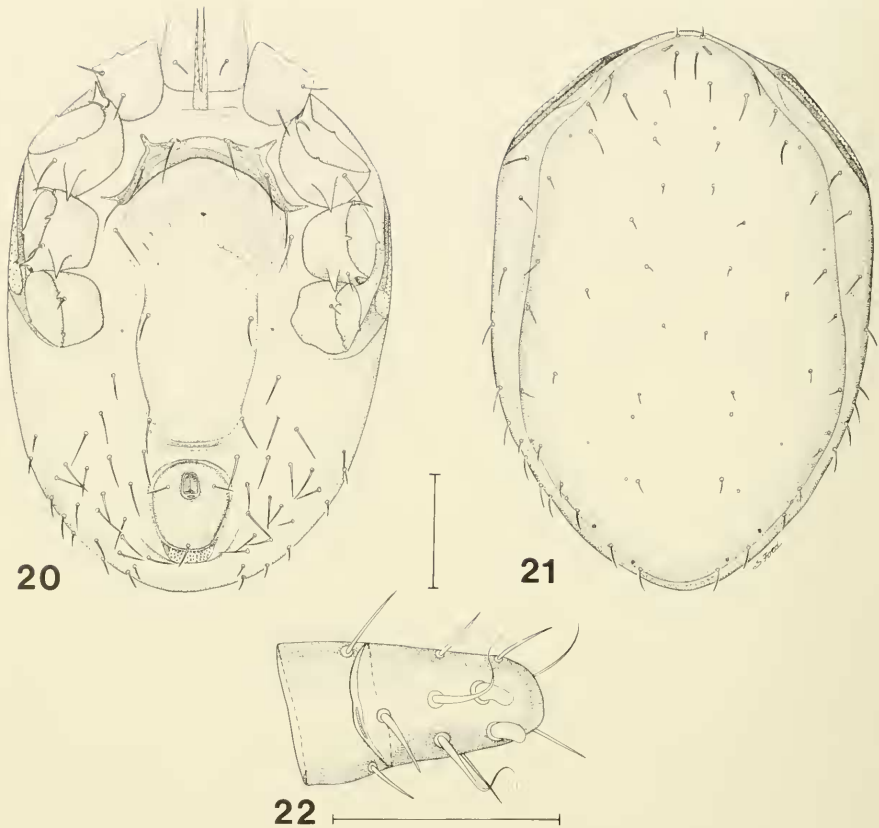


Fig. 20-22. *H. dorsolatus* n. sp., female. (20) venter; (21) dorsum, scale = 100 μ m; (22) ventral view of tarsus II, scale = 50 μ m.

acute; coxa IV with posteroventral margin serrated or toothed in position of usual spur. Setae av_1 and pv_1 of tarsus II stout and clawlike; some ventral setae of legs, especially tarsi, may be somewhat enlarged basally; usual leg setae present and normal.

Venter. Anterior margin of sternal shield moderately convex; posterior margin deeply concave (invaginated to level between setae $st. 2$ and first pair of pores); anterolateral and posterolateral projections normal. Lateral sides of genital shield slightly convex and gradually converging toward broadly rounded posterior end; line formed by end of genital flap ribs moderately arched; setae $Jv1$ apparently on posterolateral margin of shield. Anal shield broadly

oval; paranal setae at level of middle of anal field. Soft integument of venter bears 24 to 26 pairs of medium to large (length 24-28 μ m) setae. Peritreme of uniform width, except slightly wider posteriorly; extends to near middle of coxa I.

Dorsum. Greatest width of dorsal shield at level of setae $Z1$; lateral sides straight to slightly concave and covering gradually anteriorly; posterior end broadly rounded; 25 pairs of setae present on dorsal shield (setae $s3$ absent); central dorsal setae small (length 7-9 μ m) with anterior and lateral dorsal shield setae somewhat larger (length 15-24 μ m). First pair of setae of r series ($r2$) absent; 10 to 12 pairs of medium-sized (length 17-19 μ m) setae of R series pre-

sent on soft integument posterolateral to dorsal shield.

Measurements. Dorsal shield length 444 μm ; greatest width 273 μm . Peritreme length 201 μm . Sternal shield length 18 μm ; width 96 μm . Genital shield length 101 μm , greatest width 99 μm . Anal shield length 66 μm ; greatest width 72 μm . Length of tarsi: I - 65 μm ; II - 62 μm ; III - 46 μm ; and IV - 65 μm . Length of movable chela 41 μm ; length of second cheliceral segment 89 μm .

MALE: Unknown.

DEUTONYMPH: Unknown.

TYPE MATERIAL: Holotype female (SVP-04279) from *Oryzomys minutus*, Laguna Verde (3565 m), 9 km SE Tabay, Mérida, Venezuela, March 20, 1966, by N. E. Peterson, et al.; and one paratype female (SVP-04298) from *Cryptotis thomasi*, Laguna Verde (3545 m), 9 km SE Tabay, Mérida, Venezuela, March 21, 1966, by N. E. Peterson, et al.

REMARKS: This species closely resembles *H. rhipidomys*, n. sp. and *H. butantanensis*. It differs from both species in having larger ventral spurs on coxae II and III; a wider sternal shield, with the posterior margin more deeply invaginated; ventral setae Jv1 on the margin of the genital shield; a broader dorsal shield, particularly at the level of the setae Z1; the posterior end of the dorsal shield more rounded; and the dorsal setae r2 and s3 absent. In addition to these characters, *H. dorsolatus* differs from *H. butantanensis* in the absence of a spur on coxa IV, the broader anal shield, and the larger clawlike setae av₁ and pv₁ on tarsus II. *H. butantanensis*, *dorsolatus* n. sp. and *rhipidomys* n.sp. are also quite similar to *H. keenani* and *H. brachy sternum* but differ in having the stout clawlike setae av₁ and pv₁ on tarsus II and setae av₁ on tarsus IV not spiniform, coxa IV without a ventral spur (except in *H. butantanensis*), and the posterior margin of the sternal shield slightly less concave.

Hirstionyssus (*H.*) *rhipidomys* n. sp. Fig. 23-28.

DIAGNOSIS: The coxal spur formula for females is 0-2-2-0 and for males is 0-2-2-1, the ventral spurs of coxae II and III in both sexes are small to medium sized and acute, and there is no posteromarginal spur on coxa II. Setae av₁ and pv₁ of tarsus II are stout and clawlike in both sexes. In females the posterior margin of the sternal shield is moderately concave (invaginated to level of setae st. 2 or slightly beyond). The genital shield is narrowly rounded posterior-

ly, its lateral margins are moderately expanded posterior to the genital setae, and setae Jv1 touch but are not on the shield margins. The dorsal shield of both sexes is widest at the level of setae s4, and the lateral margins are straight or nearly so and converge gradually posteriorly. The posterior end of the dorsal shield is broad and bluntly wedge shaped in females and broadly rounded in males. The dorsal shield of females bears the usual 26 pairs of setae, whereas in males setae S3 is absent and the first 3 setae of the r series (r2, r3, and r4) are on the anterolateral margins of the dorsal shield.

DESCRIPTION, HOLOTYPE FEMALE: Fig. 23-25.

Legs. Coxal spur formula 0-2-2-0; ventral spurs of coxae II and III medium sized (length 11-14 μm ; basal width 6-7 μm) and acute; posteromarginal spur on coxa II missing; posteromarginal spur of coxa III medium sized (length 9-10 μm ; basal width 4-5 μm) and acute; coxa IV without spur but with marginal serrations in area of usual spur. Setae av₁ and pv₁ of tarsus II stout and clawlike; usual leg setae present and normal.

Venter. Anterior margin of sternal shield slightly convex; posterior margin moderately concave (invaginated to or slightly beyond level of setae st. 2); anterolateral and posterolateral projections normal. Lateral sides of genital shield moderately expanded posterior to genital setae and gradually converging toward posterior end; posterior end narrowly rounded; line formed by end of genital flap ribs moderately arched; setae Jv1 on soft integument may be touching but not on margin of shield. Anal shield broadly oval; paranal setae at level of middle of anal field. Soft integument of venter bears 17 to 19 pairs of medium to large (length 19-26 μm) setae. Peritreme uniform in width, except slightly wider posteriorly; extends to level of middle of coxa I or slightly beyond.

Dorsum. Greatest width of dorsal shield at level of setae s4; lateral margins straight and nearly parallel although converging slightly toward posterior end; posterior end broad, bluntly wedge shaped; usual 26 pairs of setae present and normally developed; central dorsal setae small to medium sized (length 12-15 μm) and anterior, posterior, and most lateral marginal setae medium to large (length 19-26 μm).

Measurements. Dorsal shield length 456 μm ; greatest width 228 μm . Peritreme length 202 μm . Sternal shield length 26 μm ; width 99 μm . Genital shield length 108 μm ; greatest width 96 μm . Anal shield length 65 μm ; greatest width 65 μm . Length of tarsi: I - 67 μm ; II - 55 μm ; III - 56

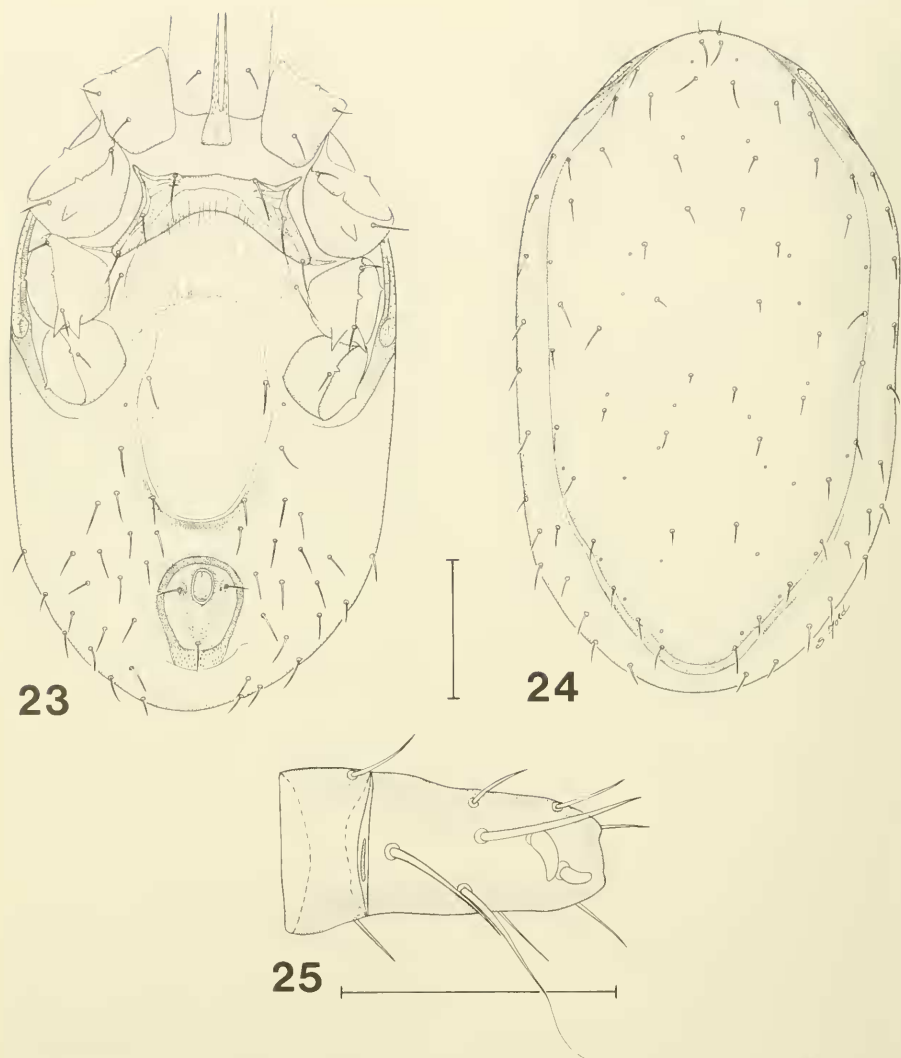


Fig. 23-25. *H. rhipidomys* n. sp., female. (23) venter; (24) dorsum, scale = 100 μm ; (25) ventral view of tarsus II, scale = 50 μm .

μm ; and IV - 72 μm . Length of movable chela 43 μm ; length of second cheliceral segment 94 μm .

ALLOTYPE MALE: Fig. 26-28.

Legs. Coxal spur formula 0-2-2-1; ventral spur of coxa II small (length 7-8 μm ; basal

width 6-8 μm) and acute; posteromarginal spur of coxa II absent; ventral and posteromarginal spurs of coxa III medium sized (length 10-12 μm ; basal width 5-6 μm) and acute; spur of coxa IV small (length 4-5 μm ; basal width 3-4 μm) and acute. Setae av_1 and pv_1 of tarsus II stout and clawlike; some ventral leg setae some-

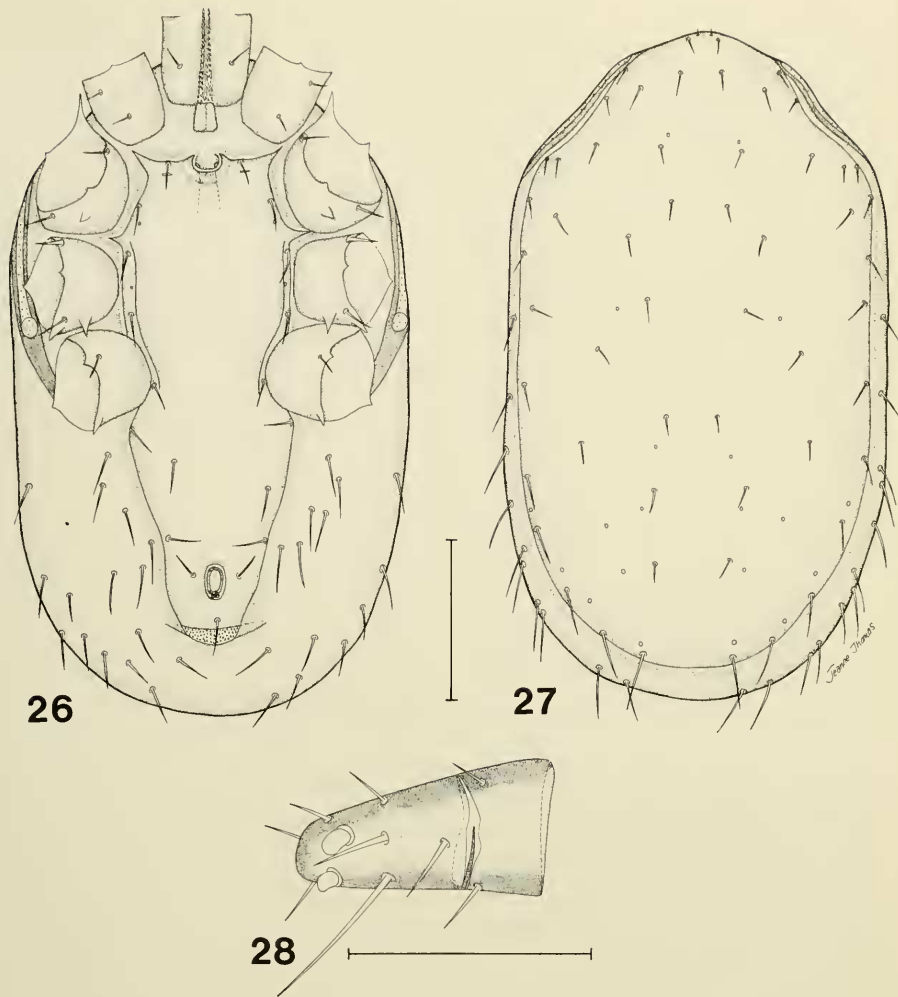


Fig. 26-28. *H. rhipidomys* n. sp., male. (26) venter; (27) dorsum, scale = 100 μm ; (28) ventral view of tarsus II, scale = 50 μm .

what enlarged basally; usual leg setae present and normally developed.

Venter. Holovenal shield normal for genus; moderate in width throughout; moderately expanded posterior to coxa IV at level of setae $\dot{Z}v1$ and only slightly constricted anterior to anal field; bears usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opisthogastric setae ($Zv1$, $Jv1$, and $Jv2$), one pair of paranal setae, and single postanal seta; all

setae on holovenal shield medium sized to large (length 17-24 μm), with distance between setae greater than setal lengths. Paranal setae at level or slightly anterior to middle of anal field. Soft integument of venter bears 14 to 16 pairs of large (length 26-29 μm) opisthogastric setae; distance between many setae less than setal lengths. Peritreme uniform in width throughout; extends anteriorly to level of middle of coxa I.

Dorsum. Dorsal shield covers almost entire dorsum; greatest width at level of setae s4; lateral sides straight or nearly so and converging gradually posteriorly; posterior end broadly rounded. Shield bears 28 pairs of setae; setae S3 absent; first 3 setae of r series (r2, r3, and r4) on margin of shield; no setae of R series on posterolateral margin; central setae of shield rather small (length 7-9 μm), anterior and lateral marginal setae medium in length (17-19 μm), and posteromarginal setae (especially Z5 and setae of S series) large (length 28-30 μm); setae Z5 about four times longer than setae J3. Eight to 10 pairs of setae of R series posterolaterally on soft integument also rather large (length 26-29 μm).

Measurements. Dorsal shield length 394 μm ; greatest width 214 μm . Peritreme length 179 μm . Holventral shield length 287 μm ; anterior width 77 μm ; greatest width posterior to genital setae 103 μm ; width at level of middle of anal field 53 μm . Length of tarsi: I - 63 μm ; II - 48 μm ; III - 51 μm ; and IV - 70 μm . Length of movable chela 41 μm ; length of second cheliceral segment 82 μm .

DEUTONYMPH: Unknown.

TYPE MATERIAL: Holotype female, allotype male, and one paratype male (SVP-00857) from *Rhipidomys venustus*, Pico Ávila (2151 m), 5 km NNE Caracas, Miranda, Venezuela, August 27, 1965, by M. D. and A. L. Tuttle; one paratype female (SVP-00818) from the same host and locality, August 26, 1965.

REMARKS: Other species closely related to *H. rhipidomys* are discussed in the treatment of *H. dorsolatus*. *H. rhipidomys* most closely resembles *H. dorsolatus*, differing in the following female characters: ventral spur of coxa II much smaller; posterior margin of sternal shield not so deeply invaginated (reaching only to level of setae st. 2 or slightly beyond); ventral setae Jv1 not on margin of genital shield; and dorsal shield narrower, with posterior end broad, bluntly wedge shaped.

H. rhipidomys was collected only from the climbing mouse (*Rhipidomys venustus*) of the subfamily Cricetinae. One collection of *H. dorsolatus* was also from a cricetine rodent, *Oryzomys minutus*.

Hirstionyssus (H.) butantanensis (Fonseca, 1932).

Ichoronyssus butantanensis: Fonseca, 1932, Mem. Inst. Butantan (São Paulo) 7:135-138.

Liponyssus latiscutatus: de Meillon and Lavoie-

pierre, 1944, J. Ent. Soc. S. Afr. 7:62; Herrin, 1974, J. Med. Entomol. 11(3):341-346.

Ichoronyssus orcadensis: Turk, 1946, Ann. Mag. Nat. Hist. 11(12):796; Evans and Till, 1966, Bull. Brit. Mus. (Nat. Hist.) Zool. 14(5):278-280, 291.

Hirstionyssus musculi: Bregetova (not Johnston, 1849), 1956, Opred. Faune SSSR 61:185; Evans and Till, 1966, Bull. Brit. Mus. (Nat. Hist.) Zool. 14(5):179-250, 291.

The redescription of the female and the descriptions of the male and deutonymph given by Herrin (1974) are adequate. Only new collection records for this species are presented here.

NEW RECORDS: Three females and one deutonymph (SVP-03724) from *Rattus rattus*, Alto Ño León (1770 m), 31 km WSW Caracas, Dto. Federal, Venezuela, December 21, 1965, by N. E. Peterson, et al.

Hirstionyssus (H.) venezuelensis n. sp. Fig. 29-35.

DIAGNOSIS: The coxal spur formula for females is 0-1-2-0 and for males 0-1-2-1. In females, the ventral spur and the posteromarginal spur of coxa III are small and blunt, whereas the posteromarginal spur of coxa IV is slender and acute. In males, spurs of all coxae III and IV are slender and acute. Setae av₁ and pv₁ of tarsus II are stout and clawlike in males but not in females. In females the sternal shield is nearly rectangular in shape, the posterior margin is only slightly invaginated, and the posterolateral projections are absent or very narrow and detached from the shield. The genital shield of females is broadly rounded to truncate posteriorly, and the lateral margins are nearly straight and parallel. The holventral shield of males is rather narrow, especially posterior to coxa IV. The dorsal shield of females is widest at the level of setae s4, the lateral margins are nearly straight and converging posteriorly, and the posterior end is narrowly rounded. The dorsal shield of males covers almost the entire dorsum, and its posterior end is broadly rounded.

DESCRIPTION, HOLOTYPE FEMALE: Fig. 29-30.

Legs. Coxal spur formula 0-1-2-0; ventral spur of coxa II absent (faint broad ridge may be present); posteromarginal spur of coxa II absent (small marginal angulation may be present); ventral spur of coxa III small (length 6-7 μm ; basal width 7-9 μm) and blunt to narrowly rounded; posteromarginal spur of coxa

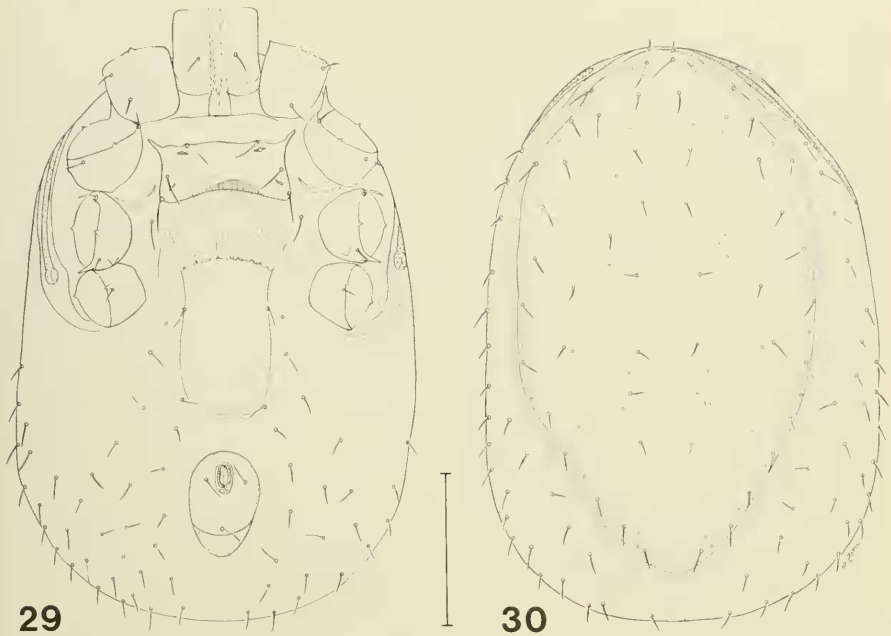


Fig. 29-30. *H. venezuelensis* n. sp., female. (29) venter; (30) dorsum, scale = 100 μ m.

III small (length 6-7 μ m; basal width 5-6 μ m), slender, and acute; spur of coxa IV absent. Setae av_1 and pv_1 of tarsus II normal, not stout and clawlike; usual leg setae present and normal.

Venter. Sternal shield generally rectangular; medially, anterior margin slightly convex, and posterior margin slightly concave (invaginated to level of second pair of pores or less); anterolateral projections normal, but posterolateral projections absent or very narrow and detached from shield; setae *st. 2* distinctly closer to *st. 3* than to *st. 1*. Genital shield slightly expanded posterior to genital setae; posterior end broadly rounded to nearly truncate; line formed by end of genital flap ribs slightly arched; setae *Jv1* on soft integument and separated from margin of shield by distance greater than setal base diameter. Anal shield elongate pyriform; paranal setae at level of middle of anal field. Soft integument of venter bears 20 to 26 medium-sized (length 14-15 μ m) setae. Peritreme of uniform width except slightly wider posteriorly; extends anteriorly to level of middle or anterior half of coxa I.

Dorsum. Greatest width of dorsal shield at

level of setae *s4*; lateral sides straight or nearly so and converging posteriorly; posterior end narrowly rounded; usual 26 pairs of setae present and normally developed; central dorsal setae small (length 10-12 μ m) and marginal setae medium sized (length 14-19 μ m).

Measurements. Dorsal shield length 460 μ m; greatest width 262 μ m. Peritreme length 211 μ m. Sternal shield length 43 μ m; width 109 μ m. Genital shield length 94 μ m; greatest width 82 μ m. Anal shield length 66 μ m; greatest width 62 μ m. Length of tarsi: I - 90 μ m; II - 70 μ m; III - 66 μ m; and IV - 76 μ m. Length of movable chela 41 μ m; length of second cheliceral segment 113 μ m.

ALLOTYPE MALE: Fig. 31-33.

Legs. Coxal spur formula 0-1-2-1; ventral spur of coxa II absent, but faint broad ridge may be present; ventral spur of coxa III small (length 8-10 μ m; basal width 6-7 μ m) and acute; posteromarginal spur of coxa III and ventral spur of coxa IV slender (length 10-13 μ m; basal width 3-5 μ m) and acute. Setae av_1 and pv_1 of tarsus II stout and clawlike; setae av_2 and av_3 of

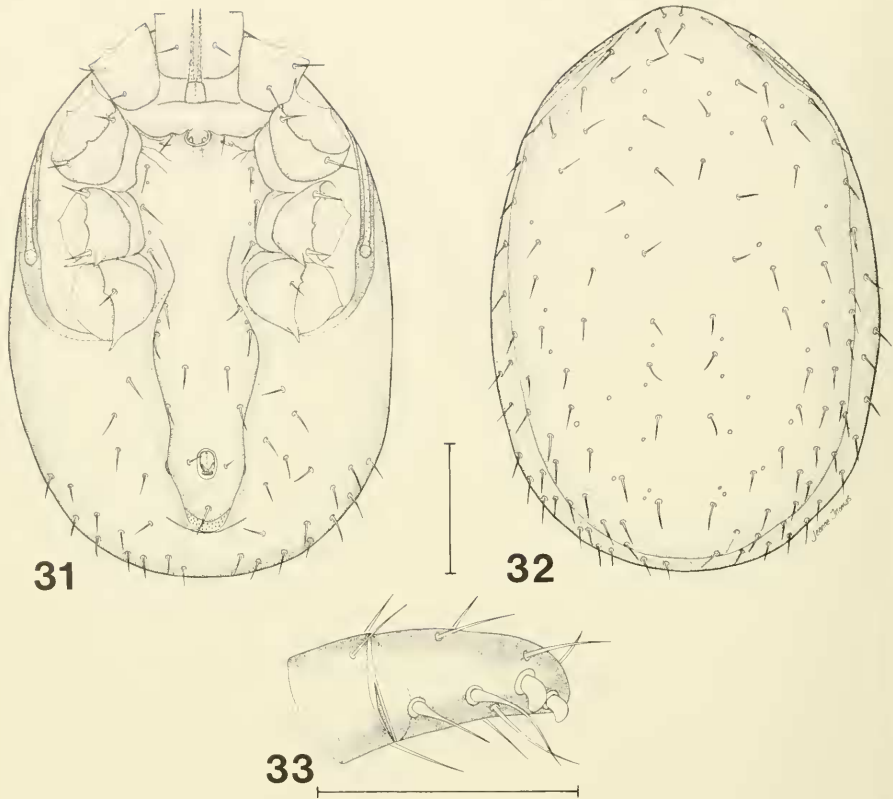


Fig. 31-33. *H. venezuelensis* n. sp., male. (31) venter; (32) dorsum, scale = 100 μm ; (33) ventral view of tarsus II, scale = 50 μm .

tarsus II and setae av_1 , av_2 , av_3 , pv_1 , and pv_2 of tarsus IV enlarged basally. All other usual leg setae present and normally developed.

Venter. Holoventral shield normal for genus, although rather narrow posterior to coxa IV; shield only slightly expanded posterior to genital setae and slightly constricted anterior to anal field; bears usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opisthogastric setae (Zv_1 , Jv_1 , and Jv_2), 1 pair of paranal setae, and single postanal seta. Paranal setae at level near middle of anal field. Soft integument of venter bears 15 to 17 pairs of medium-sized (length 13-17 μm) opisthogastric setae. Peritreme of uniform width, except slightly wider posteriorly; extends anteriorly to level of middle of coxa I.

Dorsum. Dorsal shield covers almost entire

dorsum; greatest width at level of setae s_4 ; lateral sides straight to slightly convex and gradually converging posteriorly; posterior end broadly rounded. Usual 26 pairs of dorsal setae present, as in females, plus first 3 pairs of setae of r series (r_2 , r_3 , and r_4) and 10 to 16 pairs of setae of R series which, in females, are always on soft integument. Central dorsal setae small (length 12-14 μm); marginal setae medium sized (length 14-21 μm).

Measurements: Dorsal shield length 410 μm ; greatest width 266 μm . Peritreme length 188 μm . Holoventral shield length 281 μm ; anterior width 84 μm ; greatest width posterior to genital setae 82 μm ; width at level of middle of anal field 58 μm . Length of tarsi: I - 74 μm ; II - 47 μm ; III - 46 μm ; and IV - 70 μm . Length of mov-

able chela 38 μm ; length of second cheliceral segment 80 μm .

DEUTONYMPH: Fig. 34-35.

Legs. Coxal spur formula 0-2-1-0; ventral spurs of coxae II and III small (length 2-3 μm ; basal width 7-9 μm) and broadly rounded (may be indistinct broad ridges). Usual leg setae present and normally developed.

Venter. Sternal shield bears 4 pairs of setae and 3 pairs of pores; anterior margin moderately convex; posterior end narrowed posterior to metasternal setae and narrowly rounded between genital setae; with short angular anterolateral projections. Anal shield small and pyriform in general shape; paranal setae at level of anterior end of anal field; soft integument of venter bears genital setae plus 21 to 23 pairs of small to medium-sized (length 10-14 μm) opisthogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of posterior half of coxa I.

Dorsum. Greatest width of dorsal shield at level of setae s4; anterolateral margins slightly concave at level of setae s2; medio- and pos-

terolateral sides slightly convex and converging posteriorly; posterior end narrowly rounded. Usual 26 pairs of setae on dorsal shield, all medium in length (12-14 μm) except setae Z5 which is about two times as long (20-21 μm) as adjacent setae (S5); all 5 pairs of setae of r series present laterally and 15 or 16 pairs of small (length 10-12 μm) setae posterolaterally on soft integument.

Measurements: Dorsal shield length 338 μm ; greatest width 200 μm . Peritreme length 172 μm . Sternal shield length 164 μm ; width 82 μm . Anal shield length 39 μm ; greatest width 39 μm . Length of tarsi: I - 79 μm ; II - 57 μm ; III - 58 μm ; and IV - 70 μm . Length of movable chela 42 μm ; length of second cheliceral segment 80 μm .

TYPE MATERIAL: All from *Heteromys anomalus* collected by M. D. and A. L. Tuttle. Pico Ávila, 5km NNE Caracas, Miranda, Venezuela: Holotype female, two paratype females, allotype male, two paratype males, and three paratype deutonymphs (SVP-00790), (2151m), August 24, 1965; two paratype females (SVP-00729), (2181m), August 23, 1965; and two paratype fe-

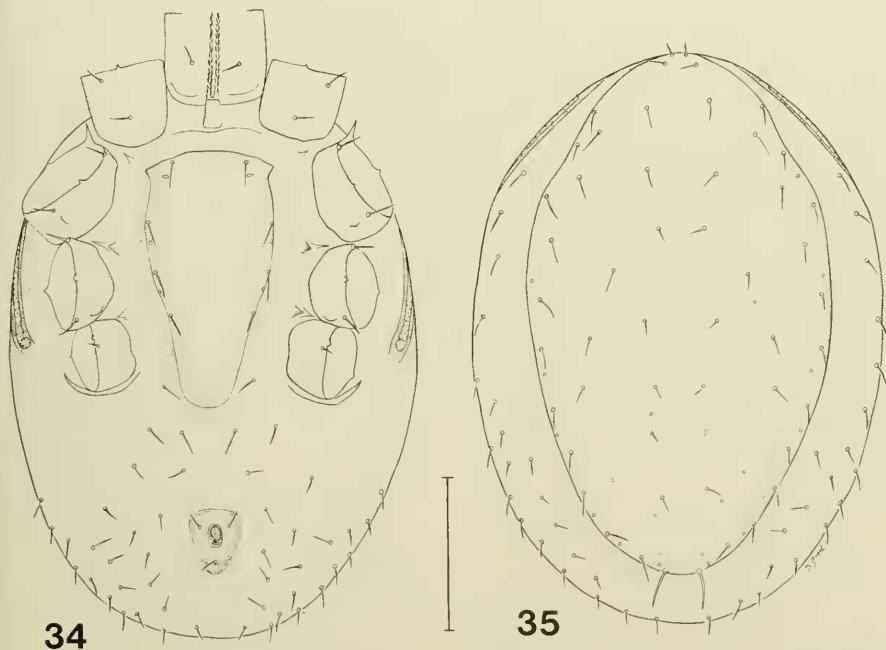


Fig. 34-35. *H. venezuelensis* n. sp., deutonymph. (34) venter; (35) dorsum, scale = 100 μm .

males (SVP-00730), (2095), August 23, 1965. Pico Ávila (2181m), Dto. Federal, Venezuela: one paratype female (SVP-00795), August 25, 1965.

ADDITIONAL MATERIAL EXAMINED: All collected by N. E. Peterson, et al. from *Heteromys anomalus* in Venezuela. Two females (SVP-02429) near Agua Santa (90m), 32km NW Valera, Trujillo, August 25, 1965; eight females (SVP-02444), near Isnoto (930m), 12km WNW Valera, Trujillo, August 27, 1965; one female (SVP-03289) near El Dividive (90m), 30km NW Valera, Trujillo, October 15, 1965; two females (SVP-04599), San Andrés (1144m), 16km SSE Caracas, Miranda, August 10, 1966; one female (SVP-13026), Quebrada Chacaito (1170m), 3km NE Caracas, Miranda, May 16, 1968; two females (SVP-13651), San Agustín (1170m), 5km NW Caripe, Monagas, June 23, 1967; five females (SVP-14294), San Agustín (1335m), 5km NW Caripe, Monagas, July 15, 1967; four females (SVP-14641), Manacal (278m), 26km ESE Carúpano, Sucre, August 1, 1967; six females (SVP-14527) Manacal (575m), 26km ESE Carúpano, Sucre, July 27, 1967; one deutonymph (SVP-14531), Manacal (190m), 26km ESE Carúpano, Sucre, July 27, 1967; one female (SVP-22959) and one female (SVP-22963), Hda. Socopito (470m), 80km NW Carora, Falcón, May 21 and 22, 1968, respectively; eighteen females and two males (SVP-23093), Río Socopito (470m), 80km NW Carora, Falcón, May 26, 1968; four females and one deutonymph (SVP-23034), Río Socopito (470m), 80 km NW Carora, Falcón, May 26, 1968; four females (SVP-23121), Río Socopito (470m), 80 km NW Carora, Falcón, May 27, 1968.

REMARKS: This species closely resembles *H. brevicarcar* n. sp. from Nicaragua, but differs in the following female characters: ventral spur of coxa II absent or at most represented by a broad indistinct ridge; sternal shield less than three times as wide as long; posterior end of genital shield more truncate in shape; posterior end of dorsal shield broad, bluntly wedge shaped rather than rounded. In males there is no ventral spur on coxa II and the holovenal shield is distinctly narrower throughout. In deutonymphs the ventral spurs are much less distinct, represented only by rather broad, rounded apophyses, and the sternal shield is narrower.

H. venezuelensis n. sp. was found only on *Heteromys anomalus*. In all, 56 females, 5 males, and 6 deutonymphs were collected from 15 host animals. In 7 of the 15 collections, specimens of *H. parvisoma* n. sp. were also recov-

ered from the same individual host. These two species differ in several distinctive characters of the female. *H. venezuelensis* n. sp. is definitely larger than *H. parvisoma* n. sp.; it lacks ventral spurs on coxae II and IV; the sternal shield is narrower and more rectangular in shape, its posterior margin is only slightly concave, and the posterolateral projections are absent or, at most, they are small and detached from the shield; and the posterior end of the dorsal shield is not as definitely rounded as in *H. parvisoma* n. sp.

Hirstionyssus (*H.*) *brevicarcar* n. sp. Fig. 36-42.

DIAGNOSIS: The coxal spur formula for females is 0-2-2-0 and for males is 0-2-2-1; the ventral spurs of coxae II and III are small and narrowly rounded in both sexes; the postermarginal spur on coxa II is represented only by a small posterior angulation; the postermarginal spur of coxa III is small, broad, and acute in females, and long, slender, and acute in males. Setae av_1 and pv_1 of tarsus II are stout and clawlike in males but not in females. In females the sternal shield is widely rectangular, the posterior margin is only slightly concave, and the posterolateral projections are absent or very narrow and detached from the shield. The dorsal shield of females is widest at the level of setae Z1, the lateral margins are nearly straight or slightly concave and converging anteriorly, and the posterior end is narrowly rounded. The dorsal shield of males is widest at the level of setae s_4 , the lateral margins are straight to slightly concave and converging posteriorly, and the posterior end is broadly rounded. The dorsal shield of both sexes bears the usual 26 pairs of setae, plus, in males, the first 3 pairs of setae of the r series and 5 or 6 pairs of setae of the R series.

DESCRIPTION, HOLOTYPE FEMALE: Fig. 36-37.

Legs. Coxal spur formula 0-2-2-0; ventral spur of coxa II small (length 7-8 μ m; basal width 6-7 μ m) and narrowly rounded; postermarginal spur of coxa II absent (small angulation may be present); ventral spur of coxa III small (length 9-10 μ m; basal width 8-10 μ m) and blunt; postermarginal spur of coxa III very small (length 4-5 μ m; basal width 2-4 μ m), lightly sclerotized, and acute; spur of coxa IV absent, but posteroventral margin may have small rounded apophysis. Setae av_1 and pv_1 of tarsus II normal, not stout and clawlike; usual leg setae present and normal.

Venter. Sternal shield widely rectangular; anterior margin straight; posterior margin

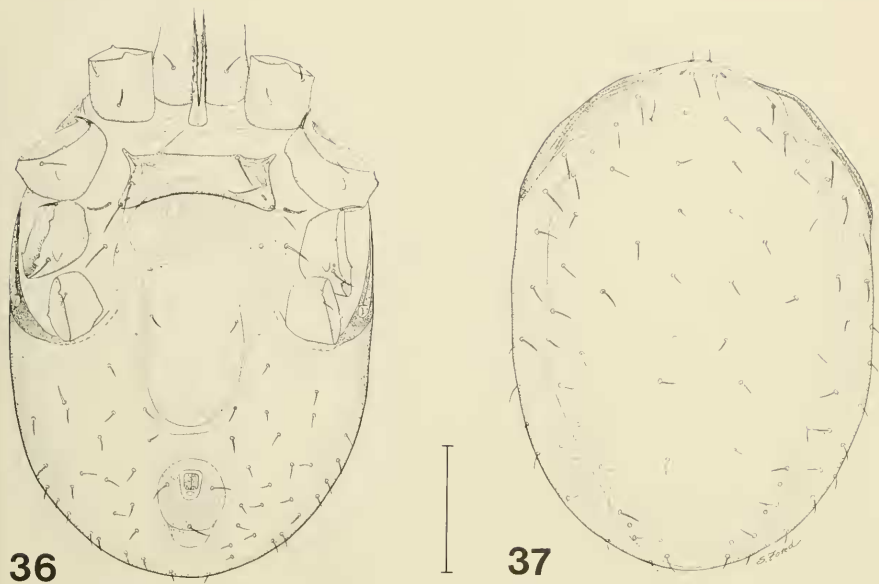


Fig. 36-37. *H. brevicar* n. sp., female. (36) venter; (37) dorsum, scale = 100 μ m.

slightly and broadly concave (invaginated to level of second pair of pores or less); antero-lateral projections normal, but posterolateral projections absent or very narrow and detached from margins of shield; setae st. 2 distinctly closer to st. 3 than to st. 1. Genital shield slightly expanded laterally posterior to genital setae and broadly rounded posteriorly; line formed by end of genital flap ribs slightly arched; setae Jv1 on soft integument, separated from margin of shield by distance greater than setal base diameter. Anal shield elongate pyriform; paranal setae at level of middle of anal field. Soft integument of venter bears 24 to 26 medium-sized (length 12-16 μ m) setae. Peritreme of uniform width, except slightly wider posteriorly; extends anteriorly to level of middle of coxa I.

Dorsum. Greatest width of dorsal shield at level of setae s6 or Z1; lateral sides irregularly straight and converging anteriorly; posterior end moderately rounded; usual 26 pairs of dorsal setae present and normally developed; central dorsal setae medium sized (length 12-14 μ m), and marginal setae larger (length 16-24 μ m).

Measurements. Dorsal shield length 378 μ m; greatest width 230 μ m. Peritreme length 176 μ m. Sternal shield length 29 μ m; width 107 μ m.

Genital shield length 79 μ m; greatest width 79 μ m. Anal shield length 54 μ m; greatest width 47 μ m. Length of tarsi: I - 70 μ m; II - 66 μ m; III - 55 μ m; and IV - 78 μ m. Length of movable chela 42 μ m; length of second cheliceral segment 123 μ m.

ALLOTYPE MALE: Fig. 38-40.

Legs. Coxal spur formula 0-2-2-1; ventral spurs of coxae II and III small (length 5-6 μ m; basal width 5-7 μ m) and narrowly rounded; posteromarginal spur of coxa III and ventral spur of coxa IV long (length 7-10 μ m; basal width 3-5 μ m), slender, and acute. Setae av, and pv, of tarsus II stout and clawlike; ventral setae of tarsi III and IV may be somewhat enlarged basally; usual leg setae present and normally developed.

Venter. Holoventral shield normal for the genus, rather wide throughout; slightly expanded posterior to genital setae and narrows sharply toward anal area; bears usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opisthogastric setae (Zv1, Jv1, and Jv2), 1 pair of paranal setae, and single postanal seta. Paranal setae at level slightly anterior to middle of anal field. Soft integument of venter bears 13 to 16 pair of medium-sized (length 11-13 μ m) opis-

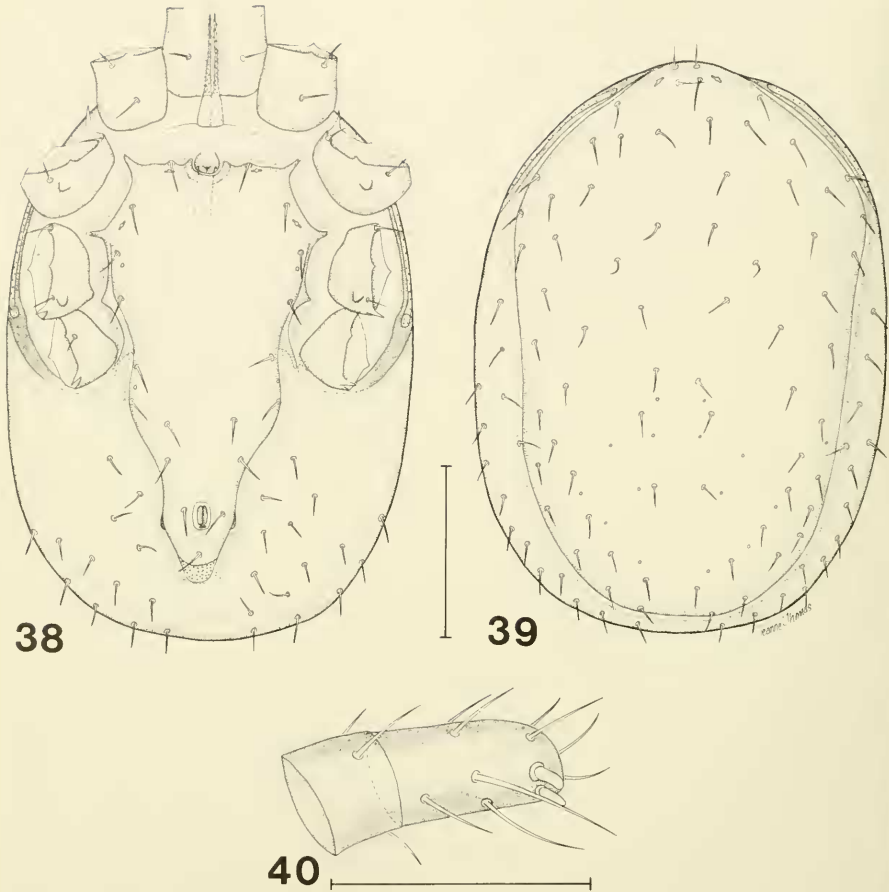


Fig. 38-40. *H. brevicar* n. sp., male. (38) venter; (39) dorsum, scale = 100 μm ; (40) ventral view of tarsus II, scale = 50 μm .

thogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of middle of coxa I.

Dorsum. Dorsal shield covers almost entire dorsum; greatest width at level of setae s4; laterally straight to slightly concave and converging posteriorly; broadly rounded posteriorly; usual 26 pairs of dorsal setae present, as in females, plus first 3 pairs of setae of r series (r2, r3, and r4) and 6 or 7 pairs of setae of R series, which in females are always on soft integument. All dorsal setae medium in length (12-19 μm) and normally developed.

Measurements. Dorsal shield length 332 μm ; greatest width 207 μm . Peritreme length 160 μm . Holovenal shield length 236 μm ; anterior width 94 μm ; greatest width posterior to genital setae 94 μm ; width at level of middle of anal field 47 μm . Length of tarsi: I - 64 μm ; II - 51 μm ; III - 49 μm ; and IV - 64 μm . Length of movable chela 35 μm ; length of second chelical segment 70 μm .

DEUTONYMPH: Fig. 41-42.

Legs. Coxal spur formula 0-2-1-0; ventral spur of coxa II small (length 2-3 μm ; basal

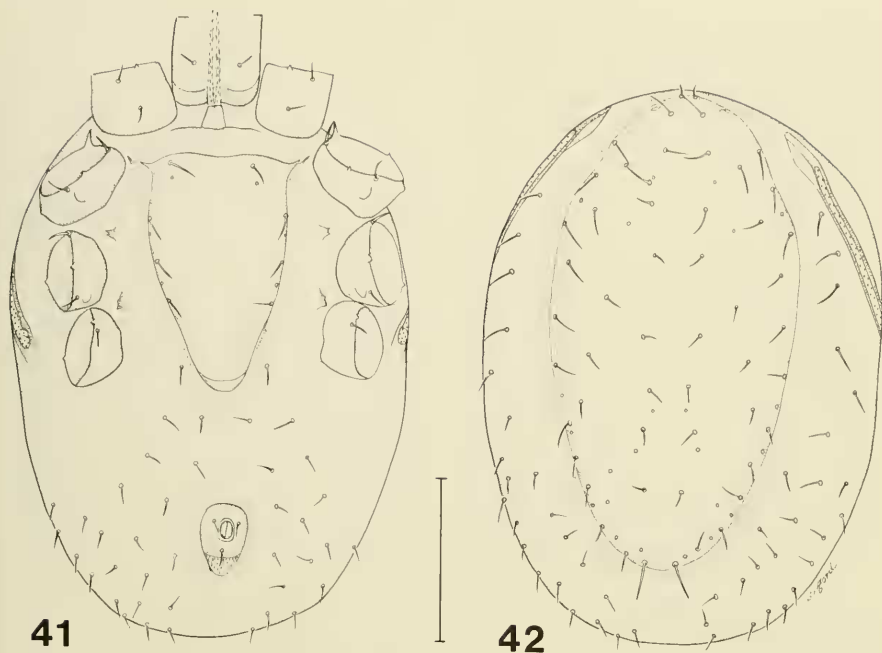


Fig. 41-42. *H. brevicalar* n. sp., deutonymph. (41) venter; (42) dorsum, scale = 100 μ m.

width 7-9 μ m) and broadly rounded (may be represented only by indistinct broad ridge); posterior margin of coxa II may have small indistinct angulation; ventral spur of coxa III small (length 3-5 μ m; basal width 5-7 μ m) and narrowly rounded; usual leg setae present and normally developed.

Venter. Sternal shield bears 4 pairs of sternal setae and 3 pairs of pores; anterior margin slightly concave medially; posterior end narrowed posterior to metasternal setae and narrowly rounded just posterior to genital setae; with short angular anterolateral projections. Anal shield small and pyriform; paranal setae at level of anterior end of anal field. Soft integument of venter bears genital setae, plus 18 to 22 pairs of small (length 8-12 μ m) opisthogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of anterior edge of coxa II.

Dorsum. Greatest width of dorsal shield at level of setae s4; anterolateral margin slightly concave at level of setae s2; medio- and posterolateral sides slightly convex and converging posteriorly; posterior end narrowly rounded.

Usual 26 pairs of setae on dorsal shield; all medium in length (10-17 μ m) except setae Z5 which are about two times as long (18-19 μ m) as adjacent setae (s5); all 5 pairs of setae of r series present laterally and 17 to 19 pairs of setae of R series present posterolaterally on soft integument.

Measurements. Dorsal shield length 288 μ m; greatest width 159 μ m. Peritreme length 133 μ m. Sternal shield length 148 μ m; width 82 μ m. Anal shield length 31 μ m; greatest width 31 μ m. Length of tarsi: I - 62 μ m; II - 51 μ m; III - 47 μ m; and IV - 58 μ m. Length of movable chela 37 μ m; length of second cheliceral segment 85 μ m.

TYPE MATERIAL: Holotype female, two paratype females, allotype male, and 1 paratype deutonymph (RML 47268) from *Lionys salvini vulcani*, Chinandega, Nicaragua, July 16, 1966, by J. K. Jones, Jr.

REMARKS: This species closely resembles *H. venezuelensis* but differs in the following female characters: ventral spur of coxa II present; sternal shield more than three times as wide as

long; posterior end of genital shield broadly rounded rather than truncate; and posterior end of dorsal shield narrowly rounded rather than broad, bluntly wedge shaped. In males coxa II bears a ventral spur and the holovenal shield is distinctly wider throughout. In the deutonymph the ventral spurs are more distinct and the sternal shield is wider.

Hirstionyssus (H.) galindoi Strandtmann and Yunker, 1966. Fig. 43-46.

Although a detailed description of the female of this species was given by Strandtmann and Yunker (1966), their description of the deutonymph was inadequate, and there were no illustrations. These deficiencies are rectified here.

DIAGNOSIS: The coxal spur formula for females is 0-2-2-1, the ventral spur of coxa II is represented only by a broad indistinct apophysis or boss, and spurs of coxae III and IV are small and acute. Setae *av*₁ and *pv*₁ of tarsus II are normal, not stout and clawlike. The posterior margin of the sternal shield is broadly and mod-

erately concave (invaginated to level of setae *st*. 2). The genital shield is moderately rounded posteriorly and its lateral margins are only slightly expanded posterior to the genital setae; setae *Jv*₁ are on the posterolateral margins of the shield. The dorsal shield is widest at the level of setae *Z*₁, its lateral margins are slightly convex and gradually converging anteriorly, its posterior end is broad, bluntly wedge shaped, and it bears the usual 26 pairs of small to medium-sized setae.

FEMALE: Fig. 43-44.

The following measurements and accompanying illustrations of a Venezuela female specimen (SVP-00571) are given to facilitate comparison with typical Panamá material.

Measurements: Dorsal shield length 460 μ m; greatest width 275 μ m. Peritreme length 204 μ m. Sternal shield length 27 μ m; width 106 μ m; Genital shield length 109 μ m; greatest width 94 μ m. Anal shield length 62 μ m; greatest width 58 μ m. Length of tarsi: I - 74 μ m; II - 70 μ m; III - 52 μ m; and IV - 71 μ m. Length of mov-

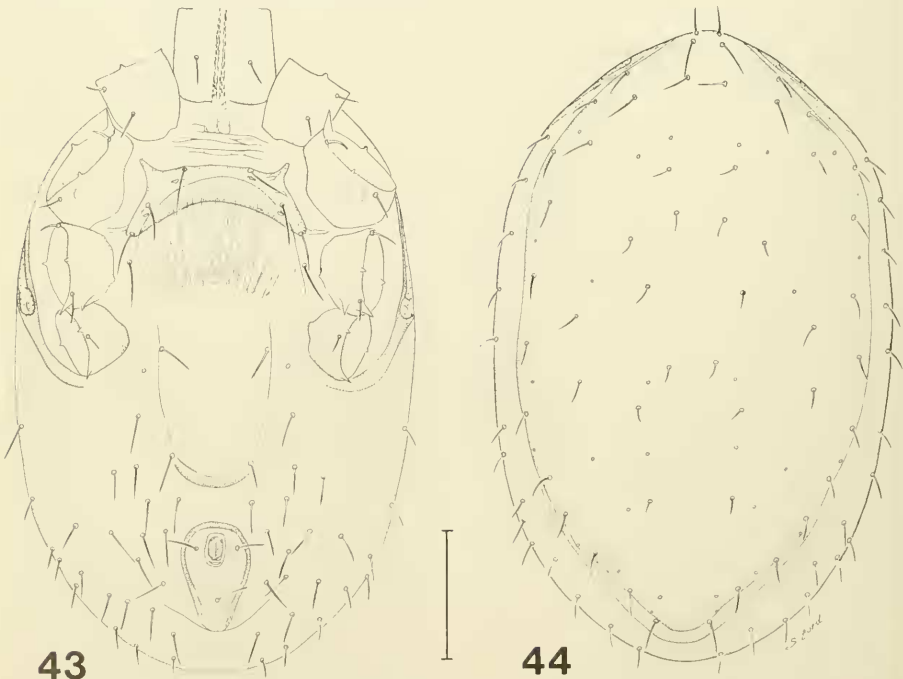


Fig. 43-44. *H. galindoi* Strandtmann and Yunker, female. (43) venter; (44) dorsum, scale = 100 μ m.

able chela 52 μm ; length of second cheliceral segment 108 μm .

MALE: Unknown.

DEUTONYMPH: Fig. 45-46.

Legs. Coxal spur formula 0-2-1-0; ventral spur of coxa II small (length 4-6 μm ; basal width 5-7 μm) and acute to blunt; ventral spur of coxa III medium sized (length 7-9 μm ; basal width 6-8 μm) and acute; posteroventral margin of coxa IV serrate; usual leg setae present and normally developed.

Venter. Sternal shield bears 4 pairs of setae and 3 pairs of pores; anterior margin slightly convex; posterior end narrowly rounded between genital setae; anterolateral projections lightly sclerotized and not definitely distinguishable. Anal shield small and pyriform; paranal setae at level slightly anterior to middle of anal field; paranal setae subequal in length to post-anal seta. Soft integument of venter bears genital setae plus about 22 pairs of small to medium-sized (length 7-17 μm) opisthogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of anterior coxa II.

Dorsum. Greatest width of dorsal shield at level of setae s4; anterolateral margins slightly concave between setae s1 and z4; lateral sides gently convex and gradually converging posteriorly; posterior end narrowly rounded; usual 26 pairs of setae present and normally developed; dorsal setae small to medium in length (7-13 μm) except setae Z5 which are three or four times as long (30-33 μm) as adjacent setae (s5); all 5 pairs of setae of r series and 13 to 16 pairs of setae of R series on soft integument and all rather small (length 7-9 μm).

Measurements. Dorsal shield length 291 μm ; greatest width 166 μm . Peritreme length 133 μm . Sternal shield length 141 μm ; width 65 μm . Anal shield length 34 μm ; greatest length 37 μm . Length of tarsi: I - 55 μm ; II - 48 μm ; III - 46 μm ; and IV - 63 μm . Length of movable chela 39 μm ; length of second cheliceral segment 79 μm .

MATERIALS EXAMINED: One female (SVP-00571) from *Oryzomys concolor*, Los Verados (1500m), 4km NNW Caracas, Dto. Federal, Venezuela, August 5, 1965, and three females (SVP-00640) from *Anoura* sp. A, Los Venados

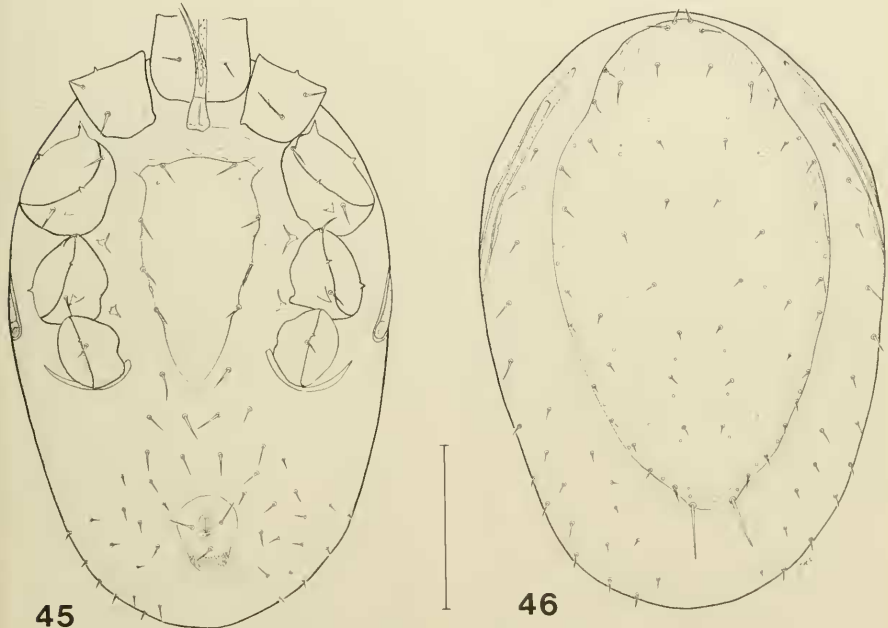


Fig. 45-46. *H. galindoi* Strandmann and Yunker, deutonymph. (45) venter; (46) dorsum, scale = 100 μm .

μm ; and IV - 70 μm . Length of movable chela (1465m), 4km NNW Caracas, Dto. Federal, Venezuela, August 15, 1965, by N. E. Peterson, M. D. Tuttle, et al. In addition to this Venezuela material, two paratype females (RML 44973) from *Peromyscus nudipes*, Cerro Punta, Chiriquí, Panamá, collected March 14, 1962, by C. E. Yunker, and two paratype deutonymphs (RML 44913) from the same host and locality, collected March 9, 1962, were examined for comparison.

REMARKS: *H. galindoi* has been collected in Panamá and Venezuela primarily from rodents of the family Cricetidae (genera *Oryzomys*, *Peromyscus*, and *Scotinomys*). Only one collection, perhaps an accidental contamination, has been recorded from a non rodent host: *Anoura* sp. A in Venezuela.

The only deviation of significance noted in the comparison of the Venezuela females with the Panamá paratypes and the original description was in the length of the sternal and anal setae. In the Venezuela specimens these setae appear to be slightly longer: the st. I setae reach to or slightly beyond the posterior margin of the shield, and the anal setae are as long as or slightly longer than the anal field. These, as well as other minor differences, are considered to be within the range of intraspecific variation. *H. galindoi* resembles *H. parvisoma* n. sp. but differs in the following characters: overall size distinctly greater, ventral spur of coxa II absent or at most represented by an indistinct apophysis, setae Jv1 on posterolateral margins of genital shield, and posterior end of dorsal shield broad, bluntly wedge shaped rather than moderately rounded.

Hirstionyssus (H.) parvisoma n. sp. Fig. 47-53.

DIAGNOSIS: The coxal spur formula for females is 0-2-2-1 and for males 0-1-2-1; the ventral spur of coxa II is small and blunt to narrowly rounded in females and absent in males; there is no posteromarginal spur on coxa II (there may be a small angulation); and the spurs of coxae III and IV of both sexes are small to medium sized and acute. Setae av_1 and pv_1 of tarsus II are stout and clawlike in males but normal in females. The posterior margin of the female sternal shield is moderately concave (invaginated to level between second pores and setae st. 2). The genital shield is narrowly rounded posteriorly, the lateral sides are only slightly expanded posterior to the genital setae, and setae Jv1 are not on the shield. The holventral shield of males is rather broad between

the coxae but somewhat narrowed posterior to coxa IV. The dorsal shield of both sexes is widest at the level of setae s4, the lateral margins are straight or slightly concave and converging gradually posteriorly, and the posterior end is narrowly rounded in females but broadly rounded in males. The dorsal shield of both sexes bears the usual 26 pairs of setae, but in males the first 3 setae of the r series and 4 to 5 setae of the R series are also present on the margins.

DESCRIPTION, HOLOTYPE FEMALE: Fig. 47-48.

Legs. Coxal spur formula 0-2-2-1; ventral spur of coxa II small (length 4-6 μm ; basal width 9-11 μm) and blunt to narrowly rounded; posteromarginal spur of coxa II absent (sometimes represented by a small angulation); ventral spur of coxa III medium sized (length 7-9 μm ; basal width 7-8 μm) and acute to blunt; posteromarginal spur of coxa III and ventral spur of coxa IV small (length 4-5 μm ; basal width 4-5 μm) and acute. Setae av_1 and pv_1 of tarsus II normal, not stout and clawlike; usual leg setae present and normal.

Venter. Anterior margin of sternal shield straight or nearly so; posterior margin moderately concave (invaginated to level between second pair of pores and setae st. 2); anterolateral projection rather short and broad, but posteromarginal projection long and narrow; setae st. 2 and 3 close-set. Genital shield slightly expanded posterior to genital setae, with lateral sides convex and posterior end narrowly to bluntly rounded; line formed by end of genital flap ribs slightly arched; setae Jv1 on soft integument and separated from margin of shield by distance greater than setal base diameter. Anal shield small and broadly oval; paranal setae at level of middle of anal field. Soft integument of venter bears 19 to 21 medium-sized (length 14-17 μm) setae. Peritreme of uniform width throughout; extends to level of anterior half of coxa I.

Dorsum. Greatest width of dorsal shield at level of setae s4; lateral sides nearly straight and converging posteriorly; posterior end narrowly rounded; usual 26 pairs of dorsal setae present and normally developed; central dorsal setae small (length 10-14 μm); anterior and lateral marginal setae slightly longer (17-20 μm).

Measurements. Dorsal shield length 351 μm ; greatest width 191 μm . Peritreme length 158 μm . Sternal shield length 22 μm ; width 84 μm . Genital shield length 78 μm ; greatest width 72 μm . Anal shield length 46 μm ; greatest width 46 μm . Length of tarsi: I - 67 μm ; II - 61 μm ; III - 60

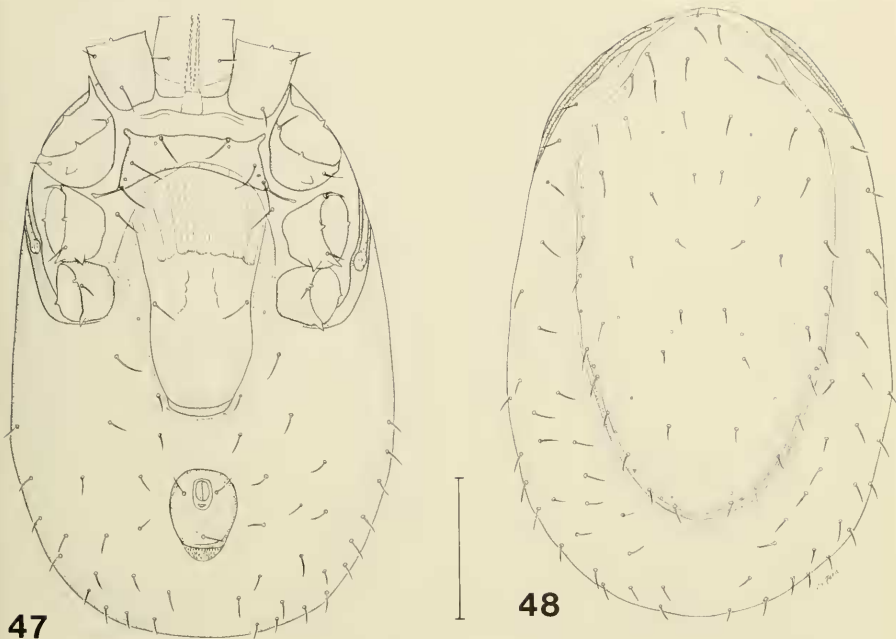


Fig. 47-48. *H. parvisoma* n. sp., female. (47) venter; (48) dorsum, scale = 100 μ m.

38 μ m; length of second cheliceral segment 87 μ m.

ALLOTYPE MALE: Fig. 49-51.

Legs. Coxal spur formula 0-1-2-1; ventral and posteromarginal spurs of coxa II absent; ventral spur of coxa III medium sized (length 7-8 μ m; basal width 4-5 μ m) and acute; posteromarginal spur of coxa III and ventral spur of coxa IV small (length 8-10 μ m; basal width 4-5 μ m), slender, and acute. Setae av_1 and pv_1 of tarsus II stout and clawlike; some ventral setae of tarsi II, III, and IV enlarged basally; other usual leg setae present and normally developed.

Venter. Holoventral shield normal for the genus; rather broad between coxae, narrowed between coxae IV, and moderately expanded immediately posterior to coxa IV. Shield bears usual 4 pairs of sternal setae, 1 pair of genital setae, 3 pairs of opisthogastric setae (Zv_1 , Jv_1 , and Jv_2), 1 pair of paranal setae, and single postanal seta; all ventral setae short to medium in length (12-19 μ m), usually less than distance between adjacent ventral setae; setae Zv_1 close to genital setae (distance between less

than length of genital setae). Paranal setae at level slightly anterior to middle of anal field. Soft integument of venter bears 13 to 15 pairs of medium-sized (length 14-17 μ m) opisthogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of middle of coxa I.

Dorsum. Dorsal shield covers almost entire dorsum; greatest width at level of setae s_4 ; lateral sides slightly concave and converging posteriorly; posterior end broadly rounded. Usual 26 pairs of dorsal setae present, plus first 3 pairs of setae of r series (r_2 , r_3 , and r_4), and 4 to 6 pairs of setae of R series, which in females are always on soft integument. Central dorsal setae small (length 11-13 μ m); anterior and lateral marginal setae somewhat larger (length 14-17 μ m).

Measurements. Dorsal shield length 331 μ m; greatest width 192 μ m. Peritreme length 156 μ m. Holoventral shield length 240 μ m; anterior width 76 μ m; greatest width posterior to genital setae 79 μ m; width at level of middle of anal field 47 μ m. Length of tarsi: I - 58 μ m; II - 58 μ m; III - 46 μ m; and IV - 62 μ m. Length of movable

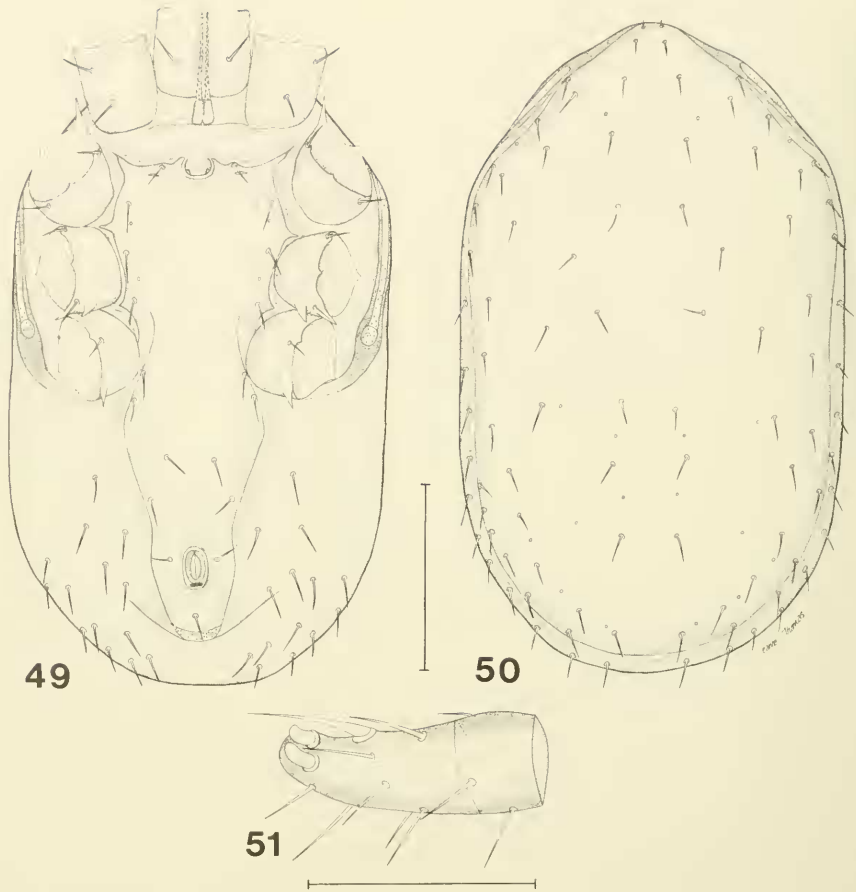


Fig. 49-51. *H. parvisoma* n. sp., male. (49) venter; (50) dorsum, scale = 100 μm ; (51) ventral view of tarsus II, scale = 50 μm .

chela 27 μm ; length of second cheliceral segment 70 μm .

DEUTONYMPH: Fig. 52-53.

Legs. Coxal spur formula 0-2-1-0; ventral spurs of coxae II and III small (length 3-4 μm ; basal width 7-9 μm) and broadly rounded, sometimes represented only by indistinct ridge; usual leg setae present and normally developed.

Venter. Sternal shield bears 4 pairs of sternal setae and 3 pairs of pores; anterior margin slightly convex; posterior end narrowed posterior to setae st. 4 and narrowly rounded between genital setae and setae Jv1; short, angular antero-

lateral projections present. Anal shield small and broadly oval; paranal setae at level near anterior end of anal field. Soft integument of venter bears genital setae, plus about 21 pairs of small (length 10-12 μm) opisthogastric setae. Peritreme of uniform width throughout; extends anteriorly to level of middle of coxa I.

Dorsum. Greatest width of dorsal shield at level of setae s4; anterolateral margin concave at level of setae s2; medio- and posterolateral sides gently convex and converging posteriorly; posterior end broadly rounded. Usual 26 pairs of setae present and normally developed; all setae small to medium in length (10-14 μm),

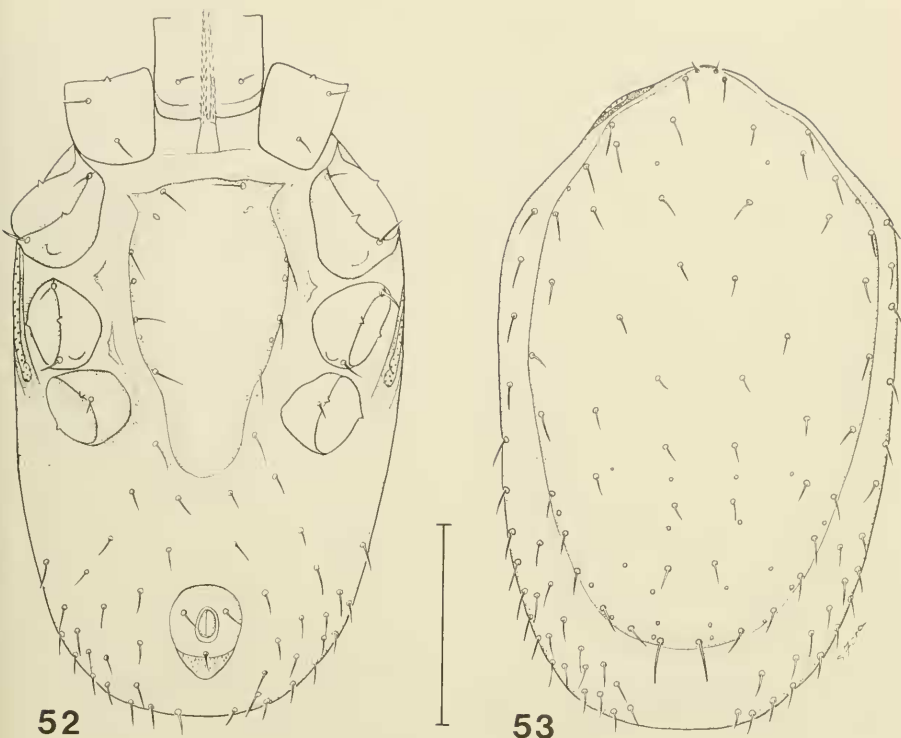


Fig. 52-53. *H. parvisoma* n. sp., deutonymph. (52) venter; (53) dorsum, scale = 100 μ m.

except setae Z5 which are about two times as long (21-22 μ m) as adjacent setae (s5); all 5 pairs of setae of r series and 16 to 21 pairs of setae of R series on soft integument.

Measurements. Dorsal shield length 318 μ m; greatest width 187 μ m. Peritreme length 148 μ m; sternal shield length 152 μ m; width 77 μ m. Anal shield length 36 μ m; greatest width 39 μ m. Length of tarsi: I - 69 μ m; II - 56 μ m; III - 47 μ m; and IV - 58 μ m. Length of movable chela 31 μ m; length of second cheliceral segment 75 μ m.

TYPE MATERIAL: Holotype female, one paratype female, allotype male, five paratype males, and three paratype deutonymphs (SVP-14641) from *Heteromys anomalus*, Manacal (278m), 26 km ESE Carúpano, Sucre, Venezuela, August 1, 1967, by N. E. Peterson, et al.; two paratype females (SVP-14527 and SVP-14530) from type host and locality (575m), July 27, 1967, by N. E. Peterson, et al.

ADDITIONAL MATERIAL EXAMINED: One female (SVP-00730) from *Heteromys anomalus*, Pico Ávila (2095m), 5km NNE Caracas, Dto. Federal, Venezuela, August 23, 1965, by M. D. and A. L. Tuttle, et al. All of the following collected by N. E. Peterson, et al.: three females (SVP-02444) nr. Isnoto (930m), 12km WNW Valera, Trujillo, Venezuela, August 27, 1965; one female (SVP-04120) from *Oryzomys minutus*, La Coromoto (3410m), 8km SE Tabay, Mérida, Venezuela, March 15, 1966; four females (SVP-13026) from *Heteromys anomalus*, Quebrada Chacaito (1170m), 3km NE Caracas, Miranda, Venezuela, May 16, 1968; one female (SVP-13651), one female (SVP-13784), six females and one male (SVP-14294) all from *Heteromys anomalus*, San Agustín (1170m, 1180m, and 1135m, respectively), 5km NW Caripe, Monagas, Venezuela, June 23, June 29, and July 15, 1967, respectively; one female (SVP-22998) from *Heteromys anomalus*, Río Socopito (470 m), 80km NW Carora, Falcón, Venezuela, May

22, 1968; and one female (SVP-036S7) from *Prochimys semispinosus* nr. La Ceiba (28m), 48km WNW Valera, Trujillo, Venezuela, November 5, 1965.

REMARKS: This species resembles *H. galindoi* but differs in the following characters: overall size much smaller, ventral spur of coxa II better developed, setae Jv1 of females not on posterolateral margins of genital shield, and posterior end of dorsal shield in females moderately rounded rather than broad, bluntly wedge shaped.

In 7 of the 12 collections of *H. parvisoma*, specimens of *H. venezuelensis* were also recovered from the same individual host. These two species differ in several significant female characters. *H. parvisoma* is distinctly smaller in overall size; the ventral spurs of coxae II and IV are absent in *H. venezuelensis* but present in *H. parvisoma*; the sternal shield of *H. parvisoma* is considerably wider and its posterior margin more deeply concave than in *H. venezuelensis*; the posterolateral projections are present and attached to the shield in the former but not in the latter; the posterior end of the dorsal shield is distinctly more rounded in *H. parvisoma*.

Incerti Sedis

One male (SVP-23281) from *Marmosa robinsoni*, Hda. Rodeo (80m), 40km NW La Paz, Zulia, Venezuela, June 10, 1968, by N. E. Peterson, et al.

One male (SVP-15563) from *Sturnira tildae*, Belén (150m), Río Cumucumuma, T.F. Amazonas, Venezuela, January 6, 1967, by M. D. Tuttle, et al.

Hosts of Neotropical *Hirstionyssus* species

Class MAMMALIA

Order MARSUPIALIA

Family Didelphidae

Genus *Marmosa* Gray

M. robinsoni

H. species (male) - Venezuela

Order INSECTIVORA

Family Soricidae

Subfamily Soricinae

Genus *Cryptotis* Pomel

C. thomasi

H. dorsolatus n. sp. - Venezuela

Order CHIROPTERA

Suborder MICROCHIROPTERA

Family Phyllostomidae

One male (SVP-10404) from *Vampyrops oratus*, Curapao (1160m), 19km E Caracas, Miranda, Venezuela, October 10, 1966, by N. E. Peterson, et al.

The above record from the marsupial, *Marmosa robinsoni*, and the two records from bats, *Sturnira tildae* and *Vampyrops oratus*, may represent laboratory contaminations or confusion of labels.

Subfamily Glossophaginae

Genus *Anoura* Gray

A. sp. A

H. galindoi Strandtmann and Yunker,
1966 - Venezuela

Subfamily Carolliinae

Genus *Carollia* Gray

C. perspicillata

H. brachy sternum n. sp. - Venezuela
H. proctolatus n. sp. - Venezuela

Subfamily Sturnirinae

Genus *Sturnira* Gray

S. tildae

H. species (male) - Venezuela

Subfamily Sternoderminae

Genus *Vampyrops* Peters

V. oratus

H. species (male) - Venezuela

Order RODENTIA

Suborder SCIUROMORPHA

Family Sciuridae

Subfamily Sciurinae

Genus *Sciurus* Linnaeus

S. igniventris

H. brachy sternum n. sp. - Venezuela

S. granatensis

H. keenani Strandtmann and Yunker,
1966 - Panamá and Venezuela

S. variegatoides

H. keenani Strandtmann and Yunker,
1966 - Panamá

Family Heteromyidae

Subfamily Heteromyinae

Genus *Liomys* Merriam

L. adspersus

- H. microchelae* Strandtmann and Yunker,
1966 - Panamá
L. salvini vulcani
H. brevicealcar n. sp. - Nicaragua
Genus *Heteromyz* Desmarest
H. heteromydis Strandtmann and Yunker,
1966 - British Honduras
H. anomalus
H. keenani Strandtmann and Yunker,
1966 - Venezuela
H. parvisoma n. sp. - Venezuela
H. proctolatus n. sp. - Venezuela
H. venezuelensis n. sp. - Venezuela
H. desmarestianus
H. heteromydis Strandtmann and Yunker,
1966 - Panamá
H. lunatus Strandtmann and Yunker,
1966 - Panamá
H. microchelae Strandtmann and Yunker,
1966 - Panamá
H. minutus Strandtmann and Yunker,
1966 - Panamá
H. panamensis Strandtmann and Yunker,
1966 - Panamá

Suborder MYOMORPHA

Family Cricetidae

Subfamily Cricetinae

Genus *Oryzomys* Baird

O. caliginosus

H. proctolatus n. sp. - Colombia

O. concolor

H. galindoi Strandtmann and Yunker,

1966 - Venezuela

- O. minutus*
H. dorsolatus n. sp. - Venezuela
H. parvisoma n. sp. - Venezuela
Genus *Peromyscus* Gloger
P. nudipes
H. galindoi Strandtmann and Yunker,
1966 - Panamá
Genus *Rhipidomys* Tschudi
R. venustus
H. rhipidomys n. sp. - Venezuela
Genus *Scotinomys* Thomas
S. xerampelinus
H. galindoi Strandtmann and Yunker,
1966 - Panamá

Family Muridae

Subfamily Murinae

Genus *Rattus* G. Fischer

R. rattus

H. butantanensis (Fonseca, 1932) -
Venezuela

R. norvegicus

H. butantanensis (Fonseca, 1932) - Brazil

Genus *Mus* Linnaeus

M. musculus

H. butantanensis (Fonseca, 1932) - Brazil

Suborder HYSTRICOMORPHA

Family Echimyidae

Subfamily Echimyinae

Genus *Proechimys* J. A. Allen

P. semispinosus

H. parvisoma n. sp. - Venezuela

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